THE

Gentleman's Diary,

OR THE

MATHEMATICAL REPOSITORY;

An ALMANACK

For the YEAR of our LORD, 1759.

BEING

The *Third* after BISSEXTILE, or LEAP-YEAR.

Containing many useful and entertaining Particulars, peculiarly adapted to the ingenious Gentlemen engaged in the delightful Study and Practice of the

MATHEMATICKS.

The Nineteenth *Almanack* published of this Kind; and the Seventh of the NEW STYLE in *England*.

——— Quâ causâ argentea Phœbe
Passibus haud æquis graditur; cur subdita nulli
Hactenus Astronomo numerorum fræna recusat:
Cur remeant Nodi, curque Auges progrediuntur.
——— Quantis refluum vaga Cynthia pontum
Viribus impellit; dum fractis fluctibus alvam
Deserit, ac Nautis suspectas nudat arenas,
Alternis vicibus suprema ad littora pulsans.

LONDON,
Printed for the Company of STATIONERS.
MDCCLIX.
[Price Nine-pence stitch'd]

PROPOSED to be engraved by *Subscription*, A Copper Plate Print (26 Inches by 21) of a new and curious Work, intituled,

THE *Geography* of the great SOLAR ECLIPSE: or, Path of of the *Penumbra* over the Earth, on *Sunday April* 1, 1764.

CONTAINING,

A PROJECTION of that Part of the Earth's *Surface*, to whose Inhabitants the Eclipse will be visible; upon which Curves are drawn, shewing the *Beginning*, *Middle*, and *End* of the ECLIPSE, at Sun Rising and Setting: The *Path* of the *Central* Shadow; the *Penumbra's* Expansion; and the Digits eclipsed at any *Place*. Also are shewn the Digits eclipsed at Sun *Rising* and *Setting*, at those Places where the *greatest* Obscuration happens before Sun *Rising*, and after Sun *Setting*. But, what is still more curious, the Time of the *Middle* of the ECLIPSE, as well as the Quantity of the *greatest* OBSCURATION, may be known by this PROJECTION to the utmost TRUTH, by little more than *bare Inspection*; which will be illustrated by an EXAMPLE. Besides which, this WORK will be further illustrated with TYPES for the most remarkable Places.

By JOHN TODD Excise-Officer, at *Tythby*, in *Nottinghamshire*.

(Price Two Shillings, plain.)

THOSE who are pleased to encourage this WORK, are desired to send their Names to the AUTHOR, at *Tythby*, where the Original may be seen: Or, to THOMAS PEAT, Writing-Master, Accomptant, and Surveyor, in *Nottingham*, by whom the *Prints* will be delivered to SUBSCRIBERS.

WE can assure the *Publick*, that this Work has been seen by several FELLOWS of the ROYAL SOCIETY, and other eminent MATHEMATICIANS, who all allow it to be a very curious and complete Piece of ASTRONOMY.

To the PUBLICK

ALL Persons who are pleased to be *Contributors* to this DIARY, by answering the *Questions*, *Ænigmas*, &c. or by sending in new ones, or other *Subjects* proper for the WORK, are desired to send *them* and their *Solutions* along with them, before the first Day of *May* 1759, directed for the Authors of the GENTLEMAN'S DIARY; to be left with THO. PEAT, School-master in *Cartergate*, NOTTINGHAM and no where else (post paid, or they will not be received.

JANUARY hath xxxi Days.

M D	☉ Decl. South.
1	23° 2′
6	22 32
11	21 50
16	20 58
21	19 55
26	18 44

First Quarter the 6th
Full Moon the 13th
Last Quarter the 21st
New Moon the 28th
} Day at {
3 in the Morning.
12 min. past 8 Morn.
47 min. past 10 Morn.
54 min. past 7 at Night.

			☽ Set A	☽ A	
1	M	Circumcision. New Year's Day.	7 A 51	8 A	7
2	Tu	Days now begin to encreaſe, being	9 13	8	5
3	W	lengthened near a quarter of an Hour.	10 33	8	59
4	Th	*Expect good Weather* (God willing) to	11 51	4	50
5	F	Old Chriſtmas-Day. [the Year's End.	Morn.	5	39
6	S	Epiphany, CHRIST's * app. to Gen	1 1	6	29
7	G	1 Sunday after Epiphany.	2 28	7	18
8	M	Lucian, Prieſt & M.	3 44	8	9
9	Tu	*Canterbury.*	4 59	9	1
10	W	Princeſs ELIZABETH born.	6 9	9	54
11	Th	Days increaſed 26 minutes.	7 10	10	48
12	F	Old New-Years Day.	☽ Riſes	Morn.	
13	S	Hilary, Biſh. & Con. ☽ eclips'd viſib	5 A 23	9	34
14	G	2 Sunday after Epiphany	6 29	1	24
15	M	*Barſton*, Yorkſhire.	7 37	2	11
16	Tu	*Hickford*, Lanc. Day 8 hours 20 m. l.	8 44	2	56
17	W	*Taviſtock*, Devonſhire.	9 49	3	38
18	Th	Priſca, Rom. V. & M.	10 54	4	18
19	F	*Nottingham. Preſton*, Lanc.	11 59	4	59
20	S	In eight Days of St. Hillary.	Morn.	5	40
21	G	3 Sunday after Epiphany. Agnes.	1 7	6	23
22	M	*Melton Mowbray*, Leiceſterſhire.	2 16	7	9
23	Tu	Term begins.	3 25	7	57
24	W	*Derby.*	4 35	8	49
25	Th	Conv. of St. PAUL.	5 42	9	44
26	F	Days increas'd an hour and quarter.	6 43	10	42
27	S	From the Day in St. Hillary on 15 D.	☽ Sets	11	42
28	G	4 Sunday after Epiphany.	5 A 8	0 A	41
29	M	*Grampound*, Cornwall.	6 41	1	38
30	Tu	K. Charles Mart. at *Whitehall*	8 6	2	33
31	W	12 min. past 1, 1649.			

M D	☉ Riſes	☉ Sets	♄ Sets	♃ Riſes	♂ Sets	♀ Riſes	☿ Sets	Cl. bef. ☉
1	8h 4′	3h 56′	8 A 20	7 M 35	4 A 46	7 M 58	5 A 27	4′ 6″
6	8 0	4 0	8 0	7 18	4 46	8 2	5 44	6 25
11	7 55	4 5	7 41	7 0	4 46	Sets	5 33	8 30
16	7 50	4 10	7 23	6 43	4 46	4 A 9	5 2	10 21
21	7 43	4 17	7 5	6 27	4 47	4 22	Riſes	11 55
26	7 36	4 25	6 47	6 10	4 49	4 37	6 M 34	13 9

FEBRUARY hath xxviii Days.

M D	☌ De South
	27° 7
6	15 38
11	14 2
16	12 20
21	10 34
26	8 43

First Quarter the 4th, Full Moon the 12th, Last Quarter the 20th, New Moon the 27th } Day at { 35 min. past 11 Morn. / 37 min. past 1 Morn. / 59 min. past 5 Morn. / 50 min. past 6 Morn.

M D	W D	Sundays; Holy and Remarkable Days, Length, inc. & dec. D. Terms, Fairs, &c.	☽ Rises & Sets	Moon South
1	Th	*Burton*, Lanc. *Lynn*, Norf. *Leominster*.	9 A 28	3 A 25
2	F	Purification V. M. Candlemas Day.	10 49	4 15
3	S	On the Morrow of the Purif. B.V.M.	Morn.	5 6
4	G	5 Sunday after Epiphany.	0 10	5 58
5	M	Agatha Sicil V. & M. *Plym*. Devon.	1 28	6 50
6	Tu	Day 9 hours 22 min. long, and Night	2 43	7 53
7	W	14 Hours 38 Minutes.	3 54	8 56
8	Th	*Bingham*, in the Vale of *Belvoir*, Not.	4 57	9 59
9	F	In eight Days of the Purif. B. V. M.	5 50	10 52
10	S	Days are now increased two Hours.	6 34	11 42
11	G	Septuagesima Sunday.	7 10	Morn.
12	M	Term Ends.	☽ Rises	0 2
13	Tu	Old Candlem. *Northallert*. (L. Elstob.)	6 A 28	0 47
14	W	Valentine, *Blaise*, Corn. *Box-Grove*,	7 33	1 30
15	Th	Days now begin to lengthen *very fast*,	8 39	2 11
16	F	being 10 hours 2 min. (consequenly	9 44	2 52
17	S	the Nights but 13 hours 58 min. long.	10 50	3 33
18	G	Sexagesima Sunday.	11 58	4 15
19	M	*Beverly*, Yorkshire.	Morn.	5 0
20	Tu	Days increased 2 hours 40 min.	1 7	5 46
21	W	*Norton*, Oxfordshire.	2 16	6 34
22	Th	*Godalming*, Surrey.	3 22	7 20
23	F	Day 10 hours 36 min. long.	4 25	8 2
24	S	St. Matthias Ap. & M.	5 20	9 2
25	G	Quinquagesima Shrove Sunday.	6 5	10 22
26	M	*Oundle*, Northamptonshire.	6 42	11 22
27	Tu	Shrove Tuesday.	☽ Sets	0 A 19
28	W	Ash-Wednesday, 1st Day of Lent.	7 A 2	1 14

M D	☉ Rises	☉ Sets	♄ Sets	☿ Rises	☿ Sets	♀ Sets	♂ Rises	Clk fast
1	7 28	4 35	6 A 27	5 M 51	4 A 51	4 A 55	6 M 9	14 11
6	7 26	4 44	6 10	5 35	4 54	5 11	6 2	14 38
11	7 8	4 53	5 54	5 18	4 58	5 27	5 59	14 46
16	6 59	5 2	5 38	5 3	5 1	5 44	6 1	14 37
21	6 49	5 12	5 23	4 48	Rises	5 1	6 1	14 18
26	6 39	5 22	Rises	4 32	6 M 43	5 17	6 3	13 53

MARCH hath xxxi Days.

M D	☉ Decl. South
1	7° 35′
6	5 [illegible]
11	3 43
16	2 [illegible]
21	North.
26	2 12

First Quarter the 5th
Full Moon the 13th
Last Quarter the 21st
New Moon the 28th
} Day at { 3 min. after 10 at Night. / 38 min. past 7 at Night. / 51 min. after 9 at Night. / 9 min. past 4 Afternoon.

The Spring Quarter begins 20 D. 9h. 22 m. app. Time.

1	Th	David Arch. B. M. *Galgarth*, Breck.	8A29	2A	8
2	F	Cedde, or Chad. B. L. *Thursk*, Yorksh.	9 54	3	0
3	S	Days are now above 11 hours long.	11 16	3	54
4	G	Quadrages. 1 Sunday in Lent.	Morn.	4	48
5	M	*Caerwye*, Flintsh. *Blandford*, Dorsetsh.	0 35	5	41
6	Tu	*Bourne*, Linc. *Walden*, Eſſ. *Lavenh.* Suff.	1 49	6	36
7	W	Ember Week. *Nottingham*, *Uppingh.*	2 57	7	31
8	Th	Cyprian.	3 54	8	23
9	F	Days are now increaſed, and Nights	4 41	9	14
10	S	decreaſed 3 hours and 3 quarters.	5 16	10	4
11	G	Reminiſcere. 2 Sunday in Lent.	5 46	10	50
12	M	*Culliford.* Devonsh. *Madim*, Kent.	6 10	11	33
13	Tu	Days are daily increaſing. [7 *Oaks*, K.	☽ Riſes	Morn.	
14	W	*Brimwelbanks*, Norf. *Northop*, Flint.	6A34	0	15
15	Th	*Langadock*, Caerm. *Oak.* Rutlandsh.	7 40	0	56
16	F	*Penſance*, Cornwall. [Wilts.	8 46	1	37
17	S	*Hariff*, Huntingdonsh. *Malmeſbury*,	9 54	2	18
18	G	Oculi. 3 Sunday in Lent.	11 1	3	2
19	M	*Abbot's Bromley*, Staff. *Ruthin*, Denb.	Morn.	3	47
20	Tu	☉ in ♈. 9 h. 22 minequal D & N.	0 10	4	35
21	W	in all the habitable Parts of the Globe.	1 17	5	25
22	Th	(*Aylſham* in Norfolk, on the 23d)	2 20	6	19
23	F	*Bodmin*, Cornw. *Skipton*, York. Wrex-	3 17	7	15
24	S	ham. *Llanerchemith*, Caerm. *Shirley*, W.	4 5	8	14
25	G	4 Sund. L. Annum. Fr. EDWARD ♔	4 44	9	11
26	M	*Glouceſter. St. Albans*, Hertf. *Preſt* Ia.	5 17	10	6
27	Tu	*Aiberſtone*, Warw. *Woodbridge*, Suff.	5 44	11	3
28	W	*Cobham*, Surrey. *Patrington*, Yorksh.	☽ Sets	11	58
29	Th	*Yarm*, Yorksh. *Stourbridge*, Worceſt.	7A32	0A54	
30	F	Day 12 hours and 3 quarters long.	8 58	1	48
31	S	*Durham*, laſts 3 Days (Luke Elſtob.)	10 23	2	44

M D	☉ Riſes	☉ Sets	♄ Riſes	♃ Riſes	♂ Riſes	♀ Sets	☿ Riſes	Cl. bet. ☉
1	5h 34′	5h 27	6 M38	4 M23	6 M 36	6 A 28	6 M 2	12′ 49′
6	6 24	5 37	6 21	4 7	6 25	6 45	6 2	11 43
11	6 14	5 47	6 3	3 51	6 13	7 3	5 59	10 35
16	6 4	5 57	5 45	3 35	6 1	7 20	5 55	9 10
21	5 58	6 3	5 29	3 20	5 50	7 37	5 52	7 39
26	5 44	6 17	5 13	3 4	5 38	7 55	5 47	5 56

APRIL hath xxx Days.

			M D	☉ Decl. North
			1	4° 32
First Quarter the 4th		33 min. aft. 10 Morn.	6	6 26
Full Moon the 12th	Day at	1 in the Afternoon.	11	8 18
Last Quarter the 20th		46 min. past 9 Morn.	16	10 7
New Moon the 26th		28 min. aft. Midnight.	21	11 51
			26	13 30

1	G	Judica, 5 Sunday in Lent.	11	A 42	3	A 40
2	M	*Lutterworth*, Leiceſterſh. *Saliſb.* Wilts	Morn.		4	36
3	Tu	*Cheſterf. Northamp. Toceſt.* Northam.	0	55	5	32
4	W	**St. Amph.** *Llanerchemith.* Angleſea.	1	57	6	26
5	Th	Old Lady Day. *Malpas*, Cheſh. (T.S.)	2	48	7	18
6	F	*Epping*, Eſſex. *Rochford*, Eſſex.	3	28	8	8
7	S	*Atherſtone*, Warwickſhire.	3	59	8	56
8	G	Palm Sund. 6 Sunday in Lent.	4	25	9	41
9	M	Day 13 hours 20 min. long, and are	4	40	10	22
10	Tu	now inc. 5 hours and above an half.	5	4	11	4
11	W	*Newport-Pagnel*, Bucks.	5	21	11	45
12	Th	*Nottingham. Hickfield*, Hampſhire.	☽ Riſes		Morn.	
13	F	Good Friday.	7	A 53	0	26
14	S	☉ due E. 6 hours 35 min.	9	1	1	8
15	G	EASTER-DAY. Our SAVIOUR's Reſ	10	10	1	53
16	M	Eaſter Monday, *Darlington*, Durh.	11	18	2	40
17	Tu	Eaſter Tueſday, *Malmſbury*, Wilts.	Morn.		3	30
18	W	*Cobham*, Surrey. *Derby.*	0	23	4	21
19	Th	*Cerne-Abbey, Elmore-Green*, Dorſetſh.	1	20	5	15
20	F	*Cank*, Staff. *Derby, Worceſter.*	2	9	6	11
21	S	*Fenchampſtead*, Berks. *Sheepwoſh*, Dev.	2	51	7	6
22	G	Low Sunday. 1 Sund. after Eaſter.	3	25	8	2
23	M	**St. George** *Northaller.* Yor. (L. Elſt.)	3	53	8	57
24	Tu	*Lincoln. Orleton*, Heref. *Pedleton*, Dorſ.	4	17	9	50
25	W	St. Mark Ev. & M *Buckingham.*	4	38	10	43
26	Th	Prince WILLIAM born.	☽ Sets		11	30
27	F	*Eaſt-Grinſtead*, Suſſex. *Heldzeray*, Dev.	7	A 58	0	A 32
28	S	*Soham*, Camb. *Pilton, Northampt.*	9	23	1	30
29	G	2 Sunday after Eaſter	10	43	2	28
30	M	From the Day of Eaſter in 15 Days.	11	53	3	26

M D	☉ Riſes	☉ Sets	♄ Riſes	♃ Riſes	♂ Riſes	♀ Sets	☿ Sets	C. bel. ☉
1	5h 33'	6h 28	4 M 52	2 M 45	5 M 24	8 A 17	6 A 40	4 4
6	5 23	6 38	4 35	2 28	5 11	8 34	7 22	2 33
11	5 13	6 48	4 17	2 11	4 59	8 52	8 7	1 7
16	5 4	6 57	4 0	1 55	4 47	9 9	8 46	0 Aft. 11
21	4 54	7 7	3 42	1 37	4 35	9 27	☽ 13	1 22
26	4 45	7 16	3 24	1 19	4 23	9 44	☽ 28	2 21

MAY hath xxxi Days.

		M D	☉ Decl. North.
First Quarter the 4th	1 min. past 1 Morning.	1	15° 4
Full Moon the 12th	46 min past 4 Morning.	6	18 32
Last Quarter the 19th	50 min. past 5 Afternoon.	11	17 52
New Moon the 26th	33 min. past 8 Morning.	16	14 6
		21	10 11
		26	21 8

1	Tu	St. Philip and Jac. Ap. & M. *Totnes.*	Morn.		4A	22
2	W	Term begins. (and *Wichsworth*, Derb.)	0	50	5	1
3	Th	*Lanc. Brecknock. Wodley*, Som. & *Watt*, S.	1	35	6	10
4	F	*Bewdley*, Wor. *Boston*, Linc. *Gravesf.* K.	2	10	6	59
5	S	*Lowth.* Linc. *Monm. Stockunder.* Som.	2	36	7	44
6	G	3 Sunday after Easter.	2	58	8	26
7	M	From the Day of Easter in 3 Weeks	3	18	9	8
8	Tu	*Philips-Norton*, Som.	3	33	9	49
9	W	*Bosworth*, Leic. *Tockingham*, Glouceſt.	3	50	10	30
10	Th	*Fringe*, Norf. *Higham-Ferrers*, North.	4	7	11	11
11	F	*Chalbury*, Oxf. *Dunſtable*, Bedf.	4	24	11	55
12	S	Old May-Day. *Leiceſter*,	☽ Riſes		Morn.	
13	G	4 Sunday after Easter.	6A	14	0	41
14	M	From the Day of Easter in 1 Month.	10	21	1	30
15	Tu	*Bakewell, Derb. Chapel-le-frith*, Derb.	11	21	2	20
16	W	*Aſhford*, K. *Caerw.* Caerm. *Cargurly*, F.	Morn.		3	15
17	Th	*Brentford*, Mid. *Holbea.* Linc. *Warth.* D.	0	14	4	9
18	F	*Hateſbury*, Bucks. *Llandyloes*, Montg.	0	56	5	4
19	S	*Hereford. Rocheſter.* and *Derby.*	1	30	5	58
20	G	5 Sunday after Easter.	1	59	6	51
21	M	From the Day of Easter in 5 Weeks.	2	23	7	43
22	Tu	*Albots-Bromley*, Staff. *Albrighton*, Shr.	2	45	8	33
23	W	Rogation Week *Morpeth*, Northumb.	3	6	9	25
24	Th	Holy Thurſday. CHRIST's Aſcenſion.	3	27	10	17
25	F	On the Morrow of the Aſcenſion.	3	51	11	13
26	S	*Perthaethwy*, Angleſea.	☽ Sets		0A	12
27	G	Exaudi. 6 Sunday after Easter.	9A	32	1	9
28	M	Term Ends. *Hadſtock*, Devonſh.	10	37	2	7
29	Tu	K. CHAR. II. Birth and Return.	11	28	3	5
30	W	*Aldſtone*, Cum. *Rocheſter*, K. *Worſ.* N.	Morn.		4	0
31	Th	Days increas'd 8 hours and half.	0	8	4	52

MD	☉ Riſes	☉ Sets	♄ Riſes	♅ Riſes	♂ Riſes	♀ Sets	☿ Sets	Cl. aft.	☉
1	4h 36'	7h 25'	3M 6	1 M 1	4 M 11	9 A 59	9 A 27	3 7	
6	4 28	7 33	2 48	0 43	3 58	10 14	9 11	3 40	
11	4 20	7 41	2 30	0 23	3 46	10 27	8 41	3 58	
16	4 12	7 48	2 11	0 4	3 33	10 37	Riſes	4 2	
21	4 5	7 55	1 52	11A 40	3 20	10 45	4 M 8	3 53	
26	3 59	8 1	1 31	11 19	3 8	10 50	3 49	3 29	

JUNE hath xxx Days.

M D	☉ Decl. North
1	22° 4′
6	22 40
11	23 7
16	23 23
21	23 29
26	23 26

First Quarter the 2d
Full Moon the 10th
Laſt Quarter the 17th
New Moon the 24th
} Day at { aq. before 5 Afternoon. / 22 min. paſt 6 Aftern. / 6 min. paſt 11 at Night. / 24 min. paſt 5 Aftern.

The Summer Quarter begins 21 D 8 h. 20 min. app. Time.

1	A	*Kathi..*, Denbyſh. D: 10 ho. 1 qr. long.	0M 39	5A 39	
2	S	*Davent. Northamp. Mark. Jew*, Cornw.	1 3	6 27	
3	G	Whit Sunday.	1 23	7 5	
4	M	Whit-Monday. Prince of Wales born.	1 40	7 46	
5	Tu	Whit-Tueſday *Newark. Folkingham.*	1 55	8 25	
6	W	Ember W. *Lenton*, Nott. *Lenham*, Kent.	2 11	9 6	
7	Th	*Montgomery. Stow*, in *Guillam*, Suff.	2 28	9 49	
8	F	Days are now increaſed 8 h. 40 m.	2 48	10 35	
9	S	*Hadderfield*, Suſſex.	3 10	11 23	
10	G	Trinity Sunday.	☽ Riſes	Morn.	
11	M	St. Barnabas ap. & M. Craſt Tim.	9A 11	0 14	
12	Tu	*Bartlow*, Eſſex. *Hadlow*, Kent.	10 8	1 6	
13	W	*Kedderminſter*, Worc. *Manhemot*, Corn.	10 54	2 1	
14	Th	*Bangor*, Cornw.	11 31	2 58	
15	F	Term begins *Royſton*, Som.	Morn.	3 53	
16	S	*Wrexham*. Denb.	0 0	4 44	
17	G	1 Sunday after Trinity. Oct. Trin.	0 25	5 36	
18	M	*Darlington*, Durham (L. Elſtob.)	0 46	6 25	
19	Tu	*Ingleton*, Yorkſh.	1 7	7 15	
20	W	*Allington*, Berks. *Derby. Hereford.*	1 27	8 6	
21	Th	☉ in ♋ 8 h. 20 m.	1 49	8 57	
22	F	K. GEO. II. Inaug *Selby*, Y. (Ch. Meſb.)	2 14	9 52	
23	S	*Armington*, Dev. *Folkingham*, Linc.	2 46	10 49	
24	G	2 Sund. aft. Trin. Nat. St. John Bap.	☽ Sets	11 47	
25	M	From the Day of the H. Trin. in 15 D.	9A 3	0A 44	
26	Tu	K. GEORGE II. proclaimed, 1727.	9 58	1 41	
27	W	*Boſton*, Linc. *Buſh*, Breck. *Burt.* Staff.	10 33	2 34	
28	Th	*Folkſt.* St. *Pombs*, Corn. *Stow Green.* D.	11 0	3 24	
29	F	St Peter. Ap. & M. *Witney*, Oxf.	11 21	4 10	
30	S	*Bridgenorth*, Sh. *Thwayte-Pariſh*, Suff.	11 40	4 54	

M D	☉ Riſes	☉ Sets	☽ Riſes	♃ Riſes	♂ Riſes	♀ Sets	♄ Riſes	Caſt. ☉
1	3h 51	8h 2	1 M 7	10A 54	2M 53	10A 53	3M 29	2′ 45
6	3 49	8 10	0 47	10 32	2 41	10 55	3 12	1 57
11	3 46	8 14	0 27	10 10	2 30	10 51	2 58	1 1
16	3 44	8 16	0 7	9 49	2 18	10 46	2 46	ob. f. 0
21	3 42	8 17	11A 43	9 26	2 6	10 41	2 39	1 4
26	3 42	8 16	11 22	9 3	1 56	10 3	2 38	2 8

JULY hath xxxi Days.

			M. D	☉ Decl. North.
First Quarter the 2d	Day at	22 min. past 9 Morn.		1 23° 10′
Full Moon the 10th		3 quarters past 5 Aftern	6	22 45
Last Quarter the 17th		a quarter past 3 Morn.	11	22 11
New Moon the 24th		49 min. past 3 Morn.	16	22 26
			21	20 33
			26	19 31

1	G	3 Sunday after Trinity.	11A57	5A35
2	M	From the Day of the H. Trin. in 3 W.	Morn.	6 16
3	Tu	*Dereham*, Norf. *Shrewſbury.*	0 12	6 37
4	W	T. ends. *Hogſharebank*, North (Elſt.)	0 29	7 38
5	Th	*Aſhborn*, Derb. *Dorcheſt. Glouceſt. Lanc.*	0 47	8 24
6	F	*Bungey*, Suff. *Liverpool*, Lanc.	1 8	9 10
7	S	T. o. a Becket.	1 32	9 59
8	G	4 Sunday after Trinity.	2 5	10 52
9	M	*Bromley*, Devonſh.	2 47	11 47
10	Tu	Old St. Peter. *Peterborough. Mansfield.*	☽ Riſes	Morn.
11	W	*Wem*, Shropſh. Day 16 h. 1 q. long.	9A26	0 43
12	Th	*Canterbury*, Kent. *Carſharlton*, Surry.	9 58	1 40
13	F	*Huntingdon. Woburn*, Bedfordſhire.	10 26	2 35
14	S	Days decreaſed 25 minutes.	10 48	3 27
15	G	5 Sunday after Trinity.	11 8	4 18
16	M	*Winchcſt. Polſtead*, Suff. *Woodhurſt*, Dor.	11 28	5 8
17	Tu	*Leck*, Staff. *Stevenage. Sutton*, Hants.	11 48	5 58
18	W	*Denbigh. Overton. Warrington*, Lanc.	Morn	6 48
19	Th	*Kenninghall*, Norfolk.	0 13	7 41
20	F	*Bartonſtacey*, Hamſh. *St. Margarets*, K.	0 41	8 36
21	S	*Alketon*, Der. *Foulneſs*, K. *Swaffham*, N.	1 18	9 32
22	G	6 Sunday after Trinity.	2 3	10 25
23	M	*Honiton. Daventry. Earl-Soham*, Suff.	2 58	11 20
24	Tu	*Faringbay*, Kent.	☽ Sets	0A20
25	W	St. James Ap. & M. *Briſto'. Derby.*	8A57	1 11
26	Th	*Malpas*, Cheſh. (Tho. Sadler.)	9 21	2 [illegible]
27	F	*Heaſon*, Yorkſh. *Milſon*, Wilts.	9 42	2 45
28	S	*Emlin*, Wor. *Fairſa.* Corn. *Portſ* Han	10 0	3 [illegible]
29	G	7 Sunday after Trinity.	10 15	4 [illegible]
30	M	Dog Days begin. *Linton*, Camb.	10 30	4 [illegible]
31	Tu	*Botley*, Staff. *Honiton*, Dev.	10 48	[illegible]

M. D	☉ Rules	☉ S.	☽ Rules	♀ Rules	♂ Rules	♀ Sets	♃ Rules	Cl. h.	☉
1	3h 46′	8 14	11 A 2	8A41	1M 46	10 A22	2 M45	3	10
6	3 49	8 11	10 42	8 19	1 37	10 12	3 11	4	[illegible]
11	3 53	8 7	10 21	Sets	1 28	10 1	Sets	4	49
16	3 58	8 2	10 [illegible]	3M31	1 10	9 40	8 A29	5	[illegible]
21	4 4	7 56	9 40	3 8	1 13	9 37	8 35	5	40
26	4 11	7 49	9 20	2 45	1 6	9 25	8 36	[illegible]	[illegible]

AUGUST hath xxxi Days.

First Quarter the 1st	Day at	half past 2 Morning.
Full Moon the 8th		3 quar. aft. 3 Afternoon.
Laſt Quarter the 15th		8 min. paſt 8 Morning.
New Moon the 22d		28 min. paſt 4 Aftern.
First Quarter the 30		38 min. paſt 7 Aftern.

M D	☉ Decl. North.
1	18° 6′
6	16 47
11	15 21
16	13 49
21	12 12
26	10 40

1	W	**Lammas Day.** *Bath*, Som.	11	A8	6	A14
2	Th	*Farm*, Y. (L. Eſt.) *Winchſt.* Hamp.	11	30	6	39
3	F	*Daventry*, Northamp. *Bedruth*, Corn.	11	59	7	47
4	S	*Epſom*, Surry. *Ravenglaſs*, Cumb.	Morn.		8	38
5	G	8 Sund. after Trin. (Epiom the 5)	0	36	9	33
6	M	*Boſton*, Linc. *Paddington*, Midd.	1	25	10	29
7	Tu	*Falmouth*, Cornw.	2	26	11	27
8	W	*Furfut*, Cornw. *Ruthin*, Denb.	☽ Riſes		Morn.	
9	Th	*Llanwiſt*, Denb. *Therkin*, Midd.	8A	28	0	24
10	F	*Flint. Stroudwater*, Gl. *Thaxted*, Eſſ.	8	53	1	18
11	S	*Aberfraw*, Angleſea. *Allchurch*, Here.	9	13	2	12
12	G	9 Sunday after Trinity.	9	34	3	4
13	M	*Northampton*. St. *Eades*, Hert. *Stow*, S.	9	55	3	55
14	Tu	Days are ſhortened almoſt 2 Hours.	10	18	4	46
15	W	*Bakewell*, Derb. *Giſborough*, Yorkſh.	10	45	5	39
16	Th	*Aſhborn*, Derb. *Donnington*, Linc.	11	19	6	32
17	F	*Bardney*, Hampſh.	12	0	7	28
18	S	Day 14 h. 24 min. long.	Morn.		8	25
19	G	10 Sunday after Trinity.	0	51	9	21
20	M	☉ N. Amplitude 16°. 35′.	1	52	10	15
21	Tu	*Arundel*, Suſſ. *Horncaſtle*, Linc.	3	1	11	8
22	W	*Bracknell*, Berks. *Penkridge*, Staff.	☽ Sets		11	57
23	Th	*Betford*, Northum. *Dinton*, Oxf.	7A	51	0A	43
24	F	St. Bartholomew, Ap. & M	8	8	1	28
25	S	*Llanerchemith*, Angl. *Milver*. Som.	8	24	2	9
26	G	11 Sunday after Trinity.	8	41	2	50
27	M	*Coventry*, Warw. *Ripley*, York.	8	57	3	31
28	Tu	Days are now decreaſing a pace.	9	16	4	13
29	W	*Oakham*, Rut. *Peverill*, Dev.	9	37	4	58
30	Th	☉ due E. 6 ho. 30′ Alt. 12°. 27′.	10	4	5	44
31	F	Day 13 h. 34 m long decr. 3 hours.	10	35	6	32

M D	☉ Riſes	☉ Sets	♄ Riſes	♃ Sets	♂ Riſes	♀ Sets	☿ Sets	Cl. bet. ☉
1	4h 20′	7 40	8 A 56	2 M 18	0 M 59	9 A 9	8 A 31	5 48″
6	4 27	7 32	8 37	1 56	0 54	8 55	8 21	5 24
11	4 35	7 24	8 17	1 35	0 50	8 41	8 12	4 56
16	4 44	7 15	7 59	1 15	0 47	8 28	7 59	3 54
21	4 53	7 6	7 39	0 54	0 44	8 14	7 44	2 49
26	5 2	6 57	7 20	0 3	0 42	8 0	7 29	1 31

SEPTEMBER hath xxx Days.

M D	☉ Decl. North.
1	8° 21′
6	6 31
11	4 37
16	2 45
21	1 0
26	1 S 12

Full Moon the 6th, 34 min. after Midnight.
Last Quarter the 13, 10 min. past 3 Afternoon.
New Moon the 21st, 35 min. past 7 Morning.
First Quarter the 21, 53 min. past 11 Morning.
The Autumnal Quarter 22 D. 21h. 52 min.

			☽		☽	
1	S	*Northmoore*, Wilts.	11A19		7A25	
2	G	12 Sunday aft. Trin. Lond. burnt.	Morn.		8	20
3	M	*Brecknock*, 6 Days. *Bridgeſtock*, Dev.	0	13	9	17
4	Tu	*Bartholomew*, London. *Namptw.* Che.	1	20	10	14
5	W	*Chipping Norton*, Oxf. *Fenningham*. Suf.	2	37	11	10
6	Th	*Falkingham*. Linc.	☽ Riſes		Morn.	
7	F	Dog Days end.	7A22		0	6
8	S	*Northamp. Ormſkirk*, Lanc. *Wirkſ.* D.	7	45	1	0
9	G	13 Sunday after Trinity.	8	6	1	54
10	M	Day 12ho. 56 m. long. dec. 3h. 36m.	8	29	2	47
11	Tu	*Tallowdown*. Dorſetſh. [*Wilton*, W.	8	54	3	41
12	W	*Brentford*, Midd. *Whitehaven*, Cumb.	9	27	4	35
13	Th	*Iron-Acton*, Gl. *Newt.* Lan. *Tregony*, C.	10	6	5	32
14	F	**Holy Croſs Day**. *Newport*, Lanc.	10	55	6	30
15	S	*Durham*. (L. Elſtob.)	11	53	7	25
16	G	14 Sunday after Trinity.	Morn.		8	22
17	M	*Llanvrſt*, Denb. *Maſham*, Yorkſh.	0	59	9	14
18	Tu	*Netheflow*, Som. *Southw. Wicks*, Eſſ.	2	9	10	3
19	W	Ember Week. *Carliſle*, Cumb. *Worc.*	3	20	10	49
20	Th	*Devizes*. Wilts. *Manchester*, Lanc.	4	30	11	34
21	F	St. Matthew, Ap. Ev. & M *Buck.*	☽ Sets		0A17	
22	S	☉ ♎ 21 ho. 52 min equal D. & N.	6A55		0	58
23	G	15 Sunday after Trinity.	7	11	1	38
24	M	*Cheſhunt*, Hertf. *Wickware*, Glouc.	7	30	2	19
25	Tu	*Cheſterfield*, Derb. *Denbigh. Witham*, E.	7	49	3	3
26	W	*Cliffe*, Suſſex. *Partheethy*, Angleſea.	8	12	3	47
27	Th	*Clapham*, Yorkſh. *Northall*, Midd.	8	42	4	35
28	F	*Glouceſter*, *Tuxford*, Nott. *Ludlow*, Sh.	9	21	5	25
29	S	St. Michael, and all Angels.	10	8	6	18
30	G	16 Sunday after Trinity.	11	8	7	13

M. D.	☉ Riſes	☉ Sets	♄ Riſes	♃ Sets	♂ Riſes	♀ Sets	☿ Sets	Cl. aft. ☉
1	5h 14	6 4	6A 58	0M12	0M39	7A 44	7 A 8	0′ 15
6	5 23	6 36	Sets	11A 49	0 38	7 29	6 48	1 50
11	5 33	6 26	4M59	11 30	0 36	7 13	6 29	3 31
16	5 43	6 16	4 40	11 13	0 36	6 57	6 6	5 16
21	5 52	6 6	4 20	10 55	0 35	6 41	Riſes	7 0
26	6 2	5 51	4 0	10 38	0 33	6 24	4 M 56	8 42

OCTOBER hath xxxi Days.

M D	☉ Decl. South
1	3° 9
6	5 5
11	7 0
16	8 52
21	10 42
26	12 37

Full Moon the 6th, Last Quarter the 13, New Moon the 20, First Quarter the 29 — Day at: a quarter past 9 Morning; 37 min. past 1 Morning; 51 min. after Midnight; 9 min. past 2 Morning.

1	M	*Abergavilly*, Mon. *Chudley*, D. *Ruthin*, D.	Morn.		8	A 9
2	Tu	*Daventry*, Nor. *Nottingham*, lasts 8 D.	0	20	9	5
3	W	*Aberforth*, Y. *Bridgewater*, S. *Woodstock*	1	38	9	59
4	Th	*Kettering*, Northamp. *Penkridge*, Staff.	3	2	10	54
5	F	*Llanvilling*, Montg. *Lamport*, Som.	4	29	11	49
6	S	*Hull*, Yorksh. *Countess-Court*, Wilts.	☽ Rises		Morn.	
7	G	17 Sunday after Trinity.	6A	38	0	42
8	M	*Abingdon*, Berks. *Chollock*, K. *Swansey*.	7	3	1	36
9	Tu	*Blackburn*, Lanc. *Lancast*. *Carmarthen*.	7	32	2	33
10	W	Old Mich. Day, *Selby*, Y. (Ch Mesban.)	8	10	3	30
11	Th	*Banbury*, Oxf. *Leicester*. St. *Albans*, Hert	8	46	4	29
12	F	*Caster*, Lin. *Caxton*, Camb. *Sevenoake*, K	9	53	5	27
13	S	*Devizes*. *Salisbury*. *Stanton*. *Sturmister*.	10	59	6	25
14	G	18 Sunday after Trinity.	Morn.		7	19
15	M	*Falsley*, Warw.	0	7	8	9
16	Tu	*Bosworth*, Leic. *Hay*, Breckn.	1	18	8	55
17	W	*Cowlinge*, Suff. *Gunworth*, *Lynn*, Norf.	2	27	9	39
18	Th	St. Luke the Evangelist.	3	37	10	23
19	F	*Oxford*. *Witchurch* Hampsh *Yarme*, Y.	4	46	11	6
20	S	*Ashborne*, Derb. *Cotchester*. *Hereford*.	☽ Sets		11	45
21	G	19 Sunday after Trinity.	5A	43	0A	26
22	M	King Geo. II. crowned. *Wells*, Som.	6	0	1	8
23	Tu	*Ripley*, Derb. *Saff*. *Wald*. Ess. *Stock*. Ch.	6	23	1	53
24	W	*Gainsborough*, L. *Stow*, G *Winaor*, B.	6	50	2	39
25	Th	*Appletrewick*, Y. *Charing*, K.	7	24	3	27
26	F	*Bramyard*, Here. *Chepstow*, M. *Granth*.	8	8	4	19
27	S	*Buckingham*. *Warwick*. *Assingham*.	9	3	5	11
28	G	20 Sun. aft. Trin. St. Sim. & St. Jud.	10	7	6	5
29	M	*Newcastle* upon *Tyne*, lasts 9 D. (L. El.)	11	19	6	59
30	Tu	*Banbury*, Ox. *Ely*, Cam. *Maidenhead*, B.	Morn		7	51
31	W	*Bridgnorth*, Shrop. *Devizes*. *Settle*, Y.	0	39	8	44

M	D	☉ Rises	☉ Sets	♄ Sets	♃ Sets	♂ Rises	♀ Sets	☿ Rises	Clast ☉
1	6h	12′	5h 47	3M 39	10 A 22	0M 32	6 A 5	4M 33	10 20
6	6	22	5 37	3 20	10 6	0 30	5 46	4 34	11 52
11	6	32	5 27	3 0	9 50	0 28	5 27	4 51	13 13
16	6	42	5 17	2 39	9 33	0 26	5 5	5 17	14 20
21	6	51	5 8	2 20	9 18	0 23	4 44	5 48	15 15
26	7	1	4 58	2 0	9 3	0 20	4 24	6 18	15 52

NOVEMBER hath xxx Days.

Full Moon the 4th — 38 min. past 6 at Night.
Last Quarter the 11 — 41 min. past 3 Afternoon.
New Moon the 19th — half past 7 at Night.
First Quarter the 27 — 3 min. past 2 Afternoon.
} Day at

M D	☉ Dec. South
1	14° 27
6	15 0
11	17 29
16	18 46
21	19 57
26	20 59

			☽		☉	
1	Th	All Saints. *Coventry*, W. *Newark*, on T.	2M	1	9A	37
2	F	Princess of Orange born. *Leek*, Staff.	3	27	10	30
3	S	On the Morrow of all Souls *Roch.* L.	4	54	11	22
4	G	21 Sunday after Trinity.	☽ Rises		Morn.	
5	M	Papists Conspiracy. *Beverly*, Yorksh.	5A	30	0	18
6	Tu	Term begins. *Newcastle*, Staff.	6	4	1	1
7	W	*Preston*, Lanc. and 4 following Days.	6	48	2	17
8	Th	*Cirencester*, *Colchester*. *Hertford*. *Kendall*.	7	42	3	17
9	F	*Darlington*. *Stamford*, Linc. Warwin.	8	45	4	17
10	S	K. GEO. II. born. *Rochester*, Kent.	9	55	5	13
11	G	22 Sun. af. Trin. Martin, *Lenton*, N.	11	7	6	7
12	M	On the Morrow of St. Martin, *Dunsta.*	Morn.		6	55
13	Tu	*Darlington*, Durh. *Huntingdon*, Her. Y.	0	19	7	40
14	W	*Brecknock*, and five following Days.	1	29	8	23
15	Th	Day 8 ho. 46 m. long. dec. 7 h. 48m.	2	36	9	4
16	F	*Andover*, Hampsh. *Montgomery*.	3	43	9	45
17	S	*Launceston*, Cornw. *Sheffield*, Yorksh.	4	49	10	25
18	G	23 Sunday after Trinity.	3	55	11	6
19	M	In eight Days of Saint Martin.	☽ Sets		11	50
20	Tu	*Blakeney*, Glouc. *Lyng*, Norf.	4A	51	0A	34
21	W	*Garstang*, Lanc. *Lamport*, Som.	5	22	1	22
22	Th	*Newcastle* upon *Tyne*, L. Elst *Dover*.	6	2	2	12
23	F	*Ashampstead*, Berks. *Chelmesford*, Ess.	6	53	3	1
24	S	Day 8 hours 22 min. long.	7	53	3	58
25	G	24 Sun. af. Trin. Pr. WILL. HEN. b.	9	3	4	50
26	M	In 15 Days of St. Martin.	10	18	5	42
27	Tu	*Littlebury*, Essex.	11	36	6	32
28	W	Term ends. *Lincoln*. *Northampton*.	Morn.		7	22
29	Th	*Ashborne*, Derb. *Oswestry*, Shropsh.	0	58	8	12
30	F	St. AND. Ap. Frs. Dowager of W. b.	2	19	9	2

M	☿	☉ Rises	☉ Sets	☽ Sets	4 Sets	♂ Rises	♀ Rises	♀ Rise.	Cl. acc. ☉
1	7h	12	4h. 47	1M 36	8 A 45	0M 15	7 M 5	6 M 53	16 13
6	7	21	4 38	1 17	8 29	0 11	6 24	Sets	16 9
11	7	29	4 30	0 57	8 13	0 6	5 47	4 A 37	15 44
16	7	37	4 22	0 36	7 57	11 A 59	5 16	4 34	14 56
21	7	45	4 15	0 15	7 41	11 51	4 50	4 34	13 15
26	7	51	4 9	11 A 51	7 45	11 44	4 31	4 32	12 22

DECEMBER hath xxxi Days.

M D	☉ Decl. South.
1	21° 51
6	22 32
11	23 3
16	23 22
21	23 29
26	23 24

Full Moon the 4th
Last Quarter the 11
New Moon the 19
First Quarter the 26
} Day at {
8 min. past 5 Morning.
21 min. past 9 Morning.
52 min. past 1 Afternoon.
33 min. past 11 at Night.

The Winter Quarter begins 21 Day, 13 ho. 27 min.

1	S	*Dulton*, Devonsh. *Rotherham*, Yorksh.	3M42	9A55	
2	G	Advent Sunday.	5 9	10 50	
3	M	*Darlington*, Durham. (Luke Elstob.)	6 36	11 48	
4	Tu	*Bangor*. *Langborn*, Berks. *Thursk*, Y.	☽ Rises	Morn.	
5	W	*Colford*, Glocestershire.	5A16	0 45	
6	Th	*Banbury*, Oxf. *Launceston*, Cornwall.	6 16	1 50	
7	F	Days are now shortened almost 8 ho.	7 26	2 51	
8	S	*Malpas*, Chesh. (Tho Sadler) *Bost*. L.	8 40	3 48	
9	G	2 Sunday in Advent.	9 52	4 40	
10	M	*Kimbolton*, Hunt. *Newport*, Shrop. *Sw*.	11 3	5 27	
11	Tu	*Bewdley*, Worc *Preston*, L. *Roch*. Kent.	Morn	6 9	
12	W	*Bedal*, York. *Chorley*, Dev. *Shrewsbury*.	0 13	6 52	
13	Th	*Folkingham*, Linc. *Leynard Stanley*, Gl.	1 2	7 33	
14	F	Days are now but 7 hours 48 m. long.	2 27	8 13	
15	S	*Atherstone*, Warw. *Nampt-wich*, Chesh.	3 33	8 55	
16	G	3 Sunday in Advent.	4 39	9 36	
17	M	*Exeter*, Devonsh. *Grantham*, Linc.	5 48	10 20	
18	Tu	*Spalding*, Linc.	6 56	11 7	
19	W	Ember Week. ☉ eclipsed invisible.	☽ Sets	11 56	
20	Th	To-morrow, i. e. 21 will be shortest D.	4A35	0A48	
21	F	St. Thom. Ap. & M. ☉ ♑ 13h. 27 m	5 33	1 42	
22	S	*Newport*. *Keams*, Montgom.	6 41	2 35	
23	G	4 Sunday in Advent.	7 54	3 27	
24	M	Days will be increasing daily.	9 12	4 17	
25	Tu	Christmas-Day.	10 39	5 6	
26	W	St. Stephen 1st Martyr.	11 48	5 54	
27	Th	St. John Ap. &	Morn.	6 43	
28	F	Innocents-Day. *Bridgewater*, Som.	1 9	7 31	
29	S	*Cockhil*, Som.	2 31	8 23	
30	G	1 Sunday after Christmas. [Year.	3 54	9 18	
31	M	No more *Fairs*, nor bad *Weather* this	5 20	10 17	

M D	☽ Rises	☉ Sets	♄ Sets	♃ Sets	♂ Rises	♀ Rise	☿ Sets	Cl. aft. ☉
1	7h 57	4h 3	11A31	7 A 9	11 A35	4M16	4 A 38	10' 37
6	8 1	3 59	11 10	6 52	11 25	4 6	4 47	8 35
11	8 5	3 55	10 49	6 36	11 15	3 59	4 59	6 21
16	8 7	3 53	10 29	6 20	11 4	3 56	5 12	3 56
21	8 8	3 52	10 8	6 4	10 52	3 56	5 20	1 26
26	8 7	3 53	9 47	5 47	10 38	3 56	5 12	Ibef. 4

A TABLE of all the KINGS and QUEENS of *England*, since the Conquest.

The Year of the Birth of each King and Queen; also the Year, Month, and Day, whereon they began to reign: beginning the Year the first Day of January, 1758.				The Length of each Reign.			The Years expired since each Reign began and ended.	
Names.	Born.	Began to Reign.		Y.	M.	D.	Beg	End
William Conq.	1027	1066	October 14	20	10	26	693	672
William Rufus	1057	1087	Septem. 9	12	10	24	672	659
Henry I.	1068	1100	Auguſt 2	35	4	0	659	624
Stephen	1105	1135	Decem. 1	18	10	24	624	605
Henry II.	1134	1154	October 25	34	8	11	605	570
Richard I.	1156	1189	July 6	9	9	0	570	560
John	1166	1199	April 6	17	6	13	560	543
Henry III.	1207	1216	October 19	56	1	0	543	487
Edward I.	1239	1272	Novem. 16	34	7	21	487	452
Edward II.	1284	1307	July 7	19	6	13	452	433
Edward III.	1312	1327	January 20	50	5	1	432	382
Richard II.	1366	1377	June 21	22	3	8	382	360
Henry IV.	1367	1399	Septem. 29	13	5	21	356	346
Henry V.	1389	1413	March 20	9	5	11	346	337
Henry VI.	1421	1422	Auguſt 31	38	6	4	337	298
Edward IV.	1442	1461	March 4	22	1	5	298	276
Edward V.	1471	1483	April 9	0	2	13	276	276
Richard III.	1443	1483	June 22	2	2	0	276	274
Henry VII.	1457	1485	Auguſt 22	23	8	0	274	250
Henry VIII.	1492	1509	April 22	37	9	6	250	212
Edward VI.	1537	1547	January 28	6	5	8	212	206
Mary I.	1516	1553	July 6	5	4	11	206	201
Elizabeth	1533	1558	Novem. 17	44	4	7	201	156
James I.	1566	1603	March 24	22	0	3	156	134
Charles I.	1600	1625	March 27	23	10	3	134	110
Charles II.	1630	1649	January 30	36	0	7	110	74
James II.	1633	1685	February 6	4	0	7	74	70
William III.	1650	1689	Feb. 13	5	10	15	70	57
Mary II.	1662			13	0	23	70	65
Anne	1665	1702	March 8	12	4	24	57	45
George I.	1660	1714	Auguſt 1	12	10	10	45	32
George II.	1683	1727	June 11	whom God preſerve.				

A Compendious TABLE of INTEREST.

Shewing the Intereſt of any Sum of Money, from a Million to a Pound; for any Number of Days, at any Rate of Intereſt.

N°.	l.	s.	d.	q.	N°.	l.	s.	d.	q.
1000000	2739	14	6	0 ,99	1000	2	14	9	2 ,14
900000	2465	15	0	3 ,29	900	2	9	3	3 ,12
800000	2191	15	7	1 ,59	800	2	3	10	0 ,11
700000	1917	16	1	3 ,89	700	1	18	4	1 ,10
600000	1643	16	8	2 ,19	600	1	12	10	2 ,80
500000	1369	17	3	0 ,49	500	1	7	5	3 ,70
400000	1095	17	9	2 ,79	400	1	1	11	0 ,50
300000	821	18	4	1 ,09	300	0	16	5	1 40
200000	547	18	10	3 ,40	200	0	10	11	2 ,30
100000	273	19	5	1 ,70	100	0	5	5	3 ,01
90000	246	11	6	0 ,32	90	0	4	11	0 ,71
80000	219	3	6	0 ,96	80	0	4	4	2 ,41
70000	191	15	7	1 ,59	70	0	3	10	0 ,11
60000	164	7	8	0 ,22	60	0	3	3	1 ,81
50000	136	19	8	2 ,85	50	0	2	8	3 ,51
40000	109	11	9	1 ,48	40	0	2	2	1 ,21
30000	84	3	10	0 ,11	30	0	1	7	0 ,90
20000	54	15	10	2 ,74	20	0	1	1	0 ,60
10000	27	7	11	1 ,37	10	0	0	6	2 ,30
9000	24	13	1	3 ,23	9	0	0	5	3 ,67
8000	21	18	4	1 ,10	8	0	0	5	1 ,40
7000	19	3	6	2 ,96	7	0	0	4	2 ,41
6000	16	8	9	0 ,82	6	0	0	3	3 ,76
5000	13	13	11	2 ,58	5	0	0	3	1 ,15
4000	10	19	2	0 ,55	4	0	0	2	2 ,52
3000	8	4	4	2 ,41	3	0	0	1	3 ,80
2000	5	9	7	0 ,27	2	0	0	1	1 ,26
1000	2	14	9	2 .14	1	0	0	0	2 .63

RULE.

Multiply the Sum by the Number of Days; and that Product by the Rate per Cent. Then cut off the two laſt Figures to the Right Hand, and the reſt you muſt find in the Table.

Example, What is the Intereſt of 100 l. for 365 Days at 5 per Cent.

N°. of Days	365			Then in the Table					
multiply by	100			againſt 1000 is	2	14	9	2	,14
Product	36500			800	2	3	10	0	,11
multiply by	5	Rate p. Cent.		20	0	1	1	0	,60
	1825100			5	0	0	3	1	,15
				Anſw.	5	0	0	0	,00

Of the Eclipses in the Year 1759.

As calculated by Mr. *Henry Green* at Nottingham, apparent Time from Leadbetter's Tables. A visible Eclipse of the Moon, *Jan.* 13, in the Morn, in ♋ 22°. 55'.

Beginning	6h	42'	44"
Middle	8	2	45
Ecliptick ☍	8	10	43
End of the Eclipse	9	22	47
Whole Duration	2	40	3

Digits eclipsed 6° 41'. The Moon will set eclipsed.

The second is of the Sun, *June* 24, between 5 and 6 Afternoon. Invis.

The third and last is of the Sun, *December* 19, at 3 Afternoon, invisible also.

By *Astronomus*, from Dr. Halley's Tables for London.

Beginning *Jan.* 13,	6	44	5
Middle	8	2	31
Ecliptick ☍	8	9	47
End	9	20	57
Duration	2	36	52

Digits eclipsed 6° 3'½. Moon sets eclipsed.

By Mr. *Thomas Crabtree*, for *Nottingham*.			Colstow Bassett.	
In ♋ 22° 54'. ☽ eclipsed. M.	6h	23'	6h	22'
Middle	7	45	7	44
End	9	7	9	6
Duration	2	44	2	44
Digits ecl.	6	37	6	37

By Mr. *Luke Elsdon*, Junior.

On *January* the 13, at 45' after 7 o'Clock in the Morning, the *Moon* will be eclipsed 6° 40' in ♋ 22° 54'. part only vis. because the ☽ sets eclipsed.

June the 24, at 23' after 5 o'Clock in the Afternoon the *Sun* will be eclipsed in ♋ 2° 45', invisible.

December the 19 at 15' after 2 o'Clock in the Afternoon the Sun will be eclipsed in ♐ 27° 30', invisible.

By Mr. *Thomas Harris* of *Bugbrook*, near *Northampton*.

Moon ecl. *Jan.* 13 Morn. vis.	Beg.		Midd.		End		Digits.	
Leadbetter's Tables for *Lond.*	6h 35	33	7h 59	20	9h 23	7	6°	43'
Brent's Tables for *London*	6 36	30	7 58	38	9 20	46	6	39
For *Bugbrook*	6 32	30	7 54	38	9 16	46	6	39
Dunthorne's Tables for *Greenwich*	6 31	39	7 52	40	9 13	41	6	½
For *Bugbrook*	6 27	39	7 48	40	9 9	41	6	½

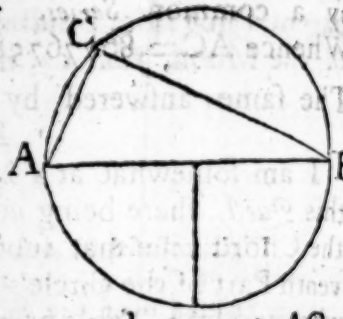
By Mr. *Samuel Tovendrew* of *Chesterfield*.

For *London*, by *Leadbetter's* Tables ☽ eclipsed *Jan.* 13 in the Morn. He sent the whole Calculation, agreeing nearly with the above.

Mr. *Thomas Harris* also observes that the Eclipse of the Sun in *June* will be visible in *North America*: and that in *December* will be visible in *South America*.

Answers to the Questions in the last Year's Diary.

(1.) Quest. 174. Answered by Mr. *J. Hudson* of *Louth*, Lincolnshire.



Let AC represent the Side of the required *Heptagon*, and put BC$=x$; then by *prop.* 36. p. 65, of *Emerson's* Trigonometry, we get $x^3-2x-x^2+1=0$. Now putting $(AB^2-BC^2)\,4-x^2=4s^2$ = Square of twice the Sine of 25° 42′ 54″, and substitute in the Equation $x^3-x^2-2x+1=0$, and we get AC=, 8677681 38.

The same answered by Mr. *Henry Green*, Nott.

Let n=the Number of Sides; r=Radius, s=Sine $\frac{360^\circ}{2n}$ and x=the required Side; then $2rs=x$ which is universal, let the Number of Sides be what they will; and in the present Case I find $x=$,8677674 true to 7 Places of Decimals, which is sufficient for common Practice; from whence the rest of the *Factors* may be found, and ranged in a Table for Use. W.W R.

The same answered by Mr. *Tho. Robinson*, of *Biddick*, near *Durham*.

Put $b=3,63395$ the Area of an *Heptagon*, when the Side is Unity. Let x=FD; $2-x$=EF, and $\sqrt{1-x}$=DF by Property of the Circle $\sqrt{2-x}\times x=\sqrt{2x-x^2}=CD$ $\therefore \overline{2x-x^2}^{\frac{1}{2}}\times 1-x\times 7=$ the Area of the Heptagon; also $\sqrt{2x-x^2}\times 4b=$ Area of the Heptagon $\therefore 7\times\sqrt{1-x}\times\overline{2x-x^2}^{\frac{1}{2}}=\sqrt{2x-x^2}\times 4b$. reduced $49\times 2x-5x^2+4x^3-x^4=\sqrt{9x^2-12x^3+4x^4}\times 16b^2$. Now each Side of the Equation divided by $2x-x^2$ is $49\times 1-2x+x^2=2x-x^2\times 16b^2$. Then $\sqrt{\frac{1-2x+x^2}{2x-xx}}=\sqrt{\frac{16b^2}{49}}=\frac{4b}{7}=2,0765428$ the Tangent of 64° 17′ 9″=<BCD. The Side of the Heptagon is,8677603014.

The

The ſame anſwered by Mr. *Will. Kingſton*, of *Bath*.

Let x=BC (ſee Mr. *Hudſon's* Fig.) Then will $x^3-x^2-2x+1=0$. The Inveſtigation may be ſeen at the latter End of *de Hoſpitals* Conic-Sections, which may be ſolved by a common *Series*. And gives $x=1,80193768312$. Whence AC=,86776758763.

The ſame anſwered by Mr. *William Bamfield* of *Honiton*, Devonſhire.

I am ſomewhat at a Loſs to account for the Propoſal of this *Queſt.* there being nothing more required than to find the Chord Line that ſubtends an < which contains one ſeventh Part of the Circle's Periphery, which is $=51^\circ\ 25'\ 42''$; whence, by a Table of natural Sines, againſt half the Angle you have,4338822; which doubled is ,8677644=the Heptagon's Side required.

Mr. *Tho. Crabtree*, of *Colſton-Baſſett*, in *Nottinghamſhire*, and others, ſent Solutions to this Queſtion; but the above are ſufficient.

(2.) Queſt. 175. Anſwered by Mr. *Stephen Hartley*, of *Sowerby-Bridge*.

Let $n=52=$ the Number to be combined. Then (by *Wolfius's Algebra*) the Number of Variations would be nn. Wherefore, if all the Antecedents be added where the Exponent is *leſs*, the Number of all the poſſible Chances will be $n^n+n^{n-1}+n^{n-2}+n^{n-3}$, &c. till the Number ſubſtracted from n, leaves one; now ſince the Number of all poſſible Changes are $\div$, the firſt Term of which is n, the largeſt n^n; and the Denominator n, therefore $\frac{n^{n+1}-n}{n-1}$ gives the Equality of Chances required, to have the ſame Cards dealt.

The ſame anſwered by Mr. *J. Holroyd*, of *Raſtrick*, in *Yorkſhire*.

Let the Number of Cards in the Pack $=52$ be expreſſed by a, and the Number of Cards dealt to him$=3=u$. Then, from the Nature of the Queſtion, and Method of Combination, we have $\frac{a-u+}{1}\times\frac{a-u+2}{2}\times\frac{a-u+3}{3}\times\frac{a-u+4}{4}$, &c. till 52; which multiplied by 6, the Number of Alternations in 3, will give the Number of Trials required.

The same answered by Mr. *Hudson*.

By the Nature of Chances $\frac{1}{52}$ will be the Chance of his getting the *Ace* first, and $\frac{1}{51}$ the Chance of his then getting the *Duce*; also $\frac{1}{50}$ will be the Chance of his getting the *Trey*; therefore $\frac{1}{52}\times\frac{1}{51}\times\frac{1}{50}=\frac{1}{132600}$. Consequently 132600 is the Number of Tryals he might give.

The same answered by Mr. *Tho. Hare* the Proposer.

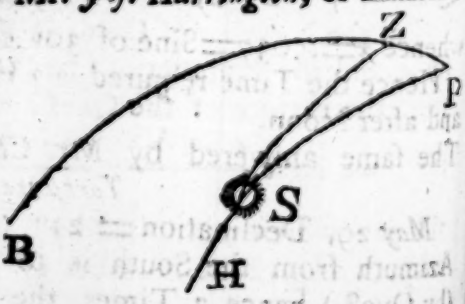
The Probability of happening at any one Tryal is $\frac{49}{52}\times\frac{48}{51}\times\frac{1}{50}\times\frac{47}{49}\times\frac{46}{48}\times\frac{45}{47}\times\frac{1}{46}\times\frac{44}{45}\times\frac{43}{44}\times\frac{42}{43}\times\frac{1}{42}=\frac{1}{132600}$. Let $x=$ the required Number of Trials; $a=1$, the Chance for happening, and $b=132599$ the Chances for failing, then (by Prob. 5. of Mr. *Simpson's* Laws of Chance) the Probability is $\frac{\overbrace{b}^{x}}{a+b}=\frac{1}{2}$ since the Chances are equal; therefore $x=\frac{\text{Log } 2}{\text{Log } a+b-\text{Log } b}=$ 91221,212 the Number of Trials required.

(3.) Quest. 176. Answered by Mr. *William Clark*, of *Watnall*, Nottinghamshire.

Let x and $y=$Sine and Cosine of $\frac{1}{4}$ of the Azimuth, or $\frac{1}{3}$ of the Altitude, f and $d=$those of the Latitude, &c.=the Sine of Declination; then (by *Spherics*) $\overline{3dxy^3-dx^3xy^4-zy^5}$ $\overline{x^5+x^4+sy^3}-3fx^2y=c$, solved $x=,1747$ the Sine of $10°\,4'$. Whence the Time of the Day is 36 min. past 2 o'Clock.

The same answered by Mr. *Jos. Harrington*, of *London*.

Given SP $=68°\ 22'$ (the Comp. of the Sun's Declination) ZP $=11°\ 0'\ 38''$ (the Com. of Latitude) and the $<$ BZS to HS as 4 to 3. Then by a Theorem in *Spherics*, the cos. of SZ $\times$ cos. ZP $-$ sine SZ $\times$ sine ZP $\times$ cos. BZS $=$ cos PS. From whence,



whence, by *Trial* and *Error*, I find the Azimuth or ∠ BZS = 40° 19′ 43″. and as 4 : 3 :: 40° 19′ 43″ : 30° 14′ 47″ = HS the Sun's Altitude.

Now, in the Triangle SZP are given ZS (the Comp. of Sun's Altitude) = 59° 45′ 13″. ZP (the Comp. of Lat.) 11° 0′ 38″. PS (the Comp. of Declination) = 68° 22′ to find the Angle P; Then

The Comp. of Sine of ZP	11° 0′ 38″	=0,7189899
The Comp. of Sine of SP	68 22	=0,0317216
The Sine of ½ the Sum of the 3 Sides	69 33 56	=9,9717730
The Sine of ½ the Sum of the 3 Sides — ZS	9 48 43	=9,2315075
		2) 19,9539920
Half is the Cosine of 18° 29′ 4″		9,9769960

Which doubled give the ∠ P 36° 58′ 8″, and being converted into Time give 2h. 27m. 52 sec. in the Afternoon; or 9h. 32 m. 8 sec. in the Morning, the Time of the Day required.

The same answered by Mr. *Thomas Hare*, of *Sheffield*, in Yorkshire.

Put s = Sine, and c = Cosine of 78° 59′ 22″ the Latitude; d = Sine of 21° 38′ 6″ the Sun's Declination; also x = Sine and y = Cosine of the Sun's Altitude; then (by *Spherics*) $\frac{sx-d}{cy}$ = Cosine of the Sun's Azimuth; And by a well known Theorem we have $\frac{4}{3}\sqrt{2-2y}\,x - \frac{1}{3}x$ = the Degrees in the Arch whose Sine is x $\frac{4}{3}\sqrt{2+\frac{2d-2sx}{cy}} - \frac{1}{3}\sqrt{1-\frac{sx-d^2}{cy}}$ = the Degrees in the Arch whose Cosine is $\frac{sx-d}{cy}$. Hence (by Question) $4\sqrt{2-2y}-x = 3\sqrt{2+\frac{2d-2sx}{cy}} - \frac{3}{4}\sqrt{1-\frac{sx-d^2}{cy}}$; whence x = ,5037 = Sine of 30° 15′.

Hence the Time required is 2 Hours 27′ 54″ 8‴, before and after Noon.

The same answered by Mr. *Charles Meshan*, of *Selby*, in *Yorkshire*.

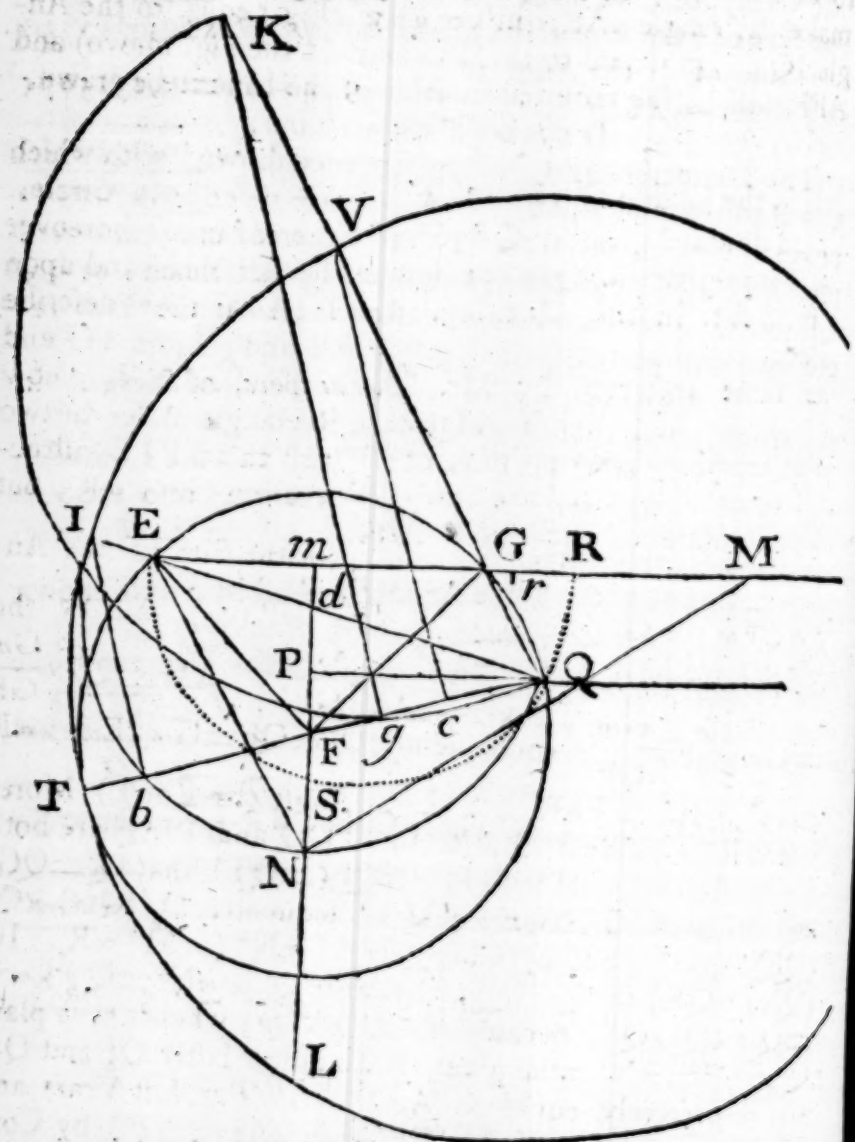
May 29, Declination = 21° 38′ N. And as the Sun's Azimuth from the South is to his Altitude, as 4 is to 5 (by Quest.) hence 3 Times the Azimuth = 4 Times the Altitude: now the Time of the Day I find (by *Trial* and *Error*) is 9h. 32′ 7″ in the Morning.

Mr.

Mr. *Bevil*, the Proposer favoured us with a Solution, as did also Messrs. *Timothy Drury*, *Henry Green*, *Stephen Hartly*, *Tho. Harris*, *John Hudson*, *William Kingstone*, *Thomas Robinson*, and others sent good Solutions to this Question, which room will not permit to insert.

(4.) Quest. 177. Answered by Mr. *Tho. Moss*, the Proposer.

CONSTRUCTION.



With a Radius $= \frac{Aa}{2}$ (see Fig. in last Year's *Diary*) describe a Circle; and make the Angle EFG, at the Centre equal to twice the given Angle A*b*, (see last Year's Fig.) join EG, and draw from (*m*) the Middle of the Chord EG, through

through the Centre F, the indefinite Line *m* FL; then let the Side of the Square, whoſe Magnitude is equal to that of the given Rectangle (190,864) be repreſented by *m*N; join EN, and draw NM perpendicular to EN; then take *m*M to *m*R in the given Ratio of *Aa* to *Ab* (in laſt Year's Fig.) and upon ER deſcribe a Semi-circle, cutting *m*N in S, alſo take *mr* equal to a fourth Proportional of GF, *m*F, and *m*R: Moreover take *m*P equal to half *m*R, and draw PQ parallel to *m*R, cutting the Periphery in Q; join QG and QE, and make the Angle *a*AE, (in laſt Year's Fig.) equal to the Angle IQT (QT equal to the Diameter in the Fig. above) and AFE will be the required Poſition of the Line to be drawn.

Demonstration.

The Diameter QFT, being ſuppoſed drawn, with which as a Radius, and upon Q as a Centre deſcribe a Circle; produce QE to meet the Periphery thereof in I; moreover produce QG, and take QK=*Ab* (Fig. laſt Year) and upon QI and QK, the two given Diameters (*Aa* and *Ab*) deſcribe the two Semi-circles, cutting QT in *b* and *g*; join TG and TE, and draw *Vc* parallel to the Perpendicular K*g*; now we are to prove that Q *g*×Q*b* (the Rectangle under the two Chords) is = *m*N² (=E*m*×*m*M:) Firſt then, by Conſtruction GF: G*m*:: *m*R : *mr*; ∴ GF × *mr* = G*m* × *m*R; but it is evident that QE × QG × $\frac{mG}{GF}$ (or the Sine of the Angle GF*m* (or GQI) = G*m* ($\frac{1}{2}$GE) × 2*m*P (*mr*); but by the laſt Proportion, *mr* (=2*m*P) =*mr*×$\frac{Gm}{GF}$, ∴ AG × QE ×$\frac{Gm}{GF}$ = G*m*×*m*R×$\frac{Gm}{GF}$; conſequently QG×QE=G*m* (E*m*) ×*m*R =*m*S², becauſe ESR is a Right Angle (by Conſt.) Moreover, it is evident (by Reaſon TGQ and TEQ are both Right Angles, and alſo QV=QI (=QT) that Q*e*=QG, and likewiſe Q*b*=QE, and conſequently Q*c* (QG) ×Q*b* (QE) =*m*S²; but by Conſtr. *m*S² : *m*N² (:: M : *m*R :: IQ (QN) : QK) :: Q*c* : Q *g*; therefore Q*c* × *m*N²=Q *g* ×*m*S² =Q *g*×Q*c*×Q*b*; becauſe *m*S²=Q*c*×Q*b*; whence it is plain Q *g*×Q*b*=*m*N²=the given Rectangle; laſtly QI and QK are reſpectively equal to *Aa* and *Ab* (Fig. laſt Year) and alſo the Angles IQK (=½EFG) = *a*A*b* (=44°) by Conſtruction. Q. E. I.

Calculation.

Firſt, it is plain, in the right angled Triangle G*m*F, are given the Hypothenuſe FG (12,5) and the Angle GF*m* (44°) whence

whence En is found = 8,9918 and Gn = 8683: Moreover in the right angled Triangle QPF are given the Hypothenuſe (12,5) and the Leg PF (= nF − nP = 8,9918 − 4775) = 4,2168 ∴ the ∠PQF is found = 19° 44′ and its Comp. (QFP) = 70° 16′, alſo the ∠QFP − GFm (44°) = the ∠ QFG (= QEG) = 26° 16′; but the Angle QEG = PQd; ∴ PQd + PQF = the ∠EQF (= aAE ſee Fig. laſt Year) = 52° 52′ the required Poſition of the Line Qgb (AFE ſame Fig.)

Again in the right angled Triangle IbQ are given the Hypothenuſe QI (= Aa = 25 ſame Fig.) and the Angles; whence the Side (or Chord) Qb (AE) is found = 21. Alſo, in the right-angled Triangle KgQ are given the Hypothenuſe K Q (= Ab (= 40) ſame Fig.) and the Angles, whence by *Trig.* the Leg (or Chord) Qg (AF) is found = 9,0888.

We received a curious Conſtruction from Mr. *Charles Wildbore*, but *too late*.

The ſame anſwered *Algebraically*, by Mr. *Timothy Drury*, of *Great Houghton*, Yorkſhire.

Let fall the Perpendiculars *b*F, and *a*E (ſee the Propoſer's Figure) and let *s* &c. = Sine and Coſine of 44°. *a* = 25, *b* = 40. And let *x* and *y* = Sine and Coſine of FA*b*. Then *sx* + *cy* = Cos. of E*Aa*, by Trig. *asx* + *acy* = EA and *by* = FA, Whence *by* × *asx* + *acy* = 190,864 = *p* (by Queſt) put $\sqrt{1-y^2} = x$ in the Equation, and reduced gives $b^2 a^2 c^2 y^4 + b^2 a^2 s^2 y^4 - b^2 a^2 s^2 y^2 - 2pbacy^2 = -p^2$. Again by dividing by the Coefficient of the higheſt Power, and afterwards putting u = half the Coefficient of y^2 and q = the Quotient $-p^2 - u$ by the Coefficient of the higheſt Power, we get $y = \sqrt{\sqrt{-q + a^2} + a} = ,227234 = 13° 8'$, whence AF = 9,08936 and AE = 20,99868, and their Product = 190,864 *Proof*.

The ſame anſwered by Mr. *William Kingſtone*, of *Bath*.

Let *a* = 40 = *Ab* (ſee Mr. *Moſs's* Fig. laſt Year) *b* = 25 = A*a*, *d* = 190,864 = AF × AE; *m* and *n* = Sine and Coſine 44° = ∠*aAb*; *x* and *y* = Sine and Coſine of ∠F*b*A, whence *my* + *nx* = Sine ∠E*a*A. And by *Trigonometry* we have 1 : *b* :: *my* + *nx* : *bmy* + *bnx* = AE. And as 1 : *a* :: *x* : *ax* = AF, hence *abmxy* + *abnx*² = *d* ∴ *abmxy* + *abnx*² = *dx*² + *dy*² (becauſe 1 = *x*² + *y*².) This being ÷ed by *xy* we have $abm + abn\frac{x}{y} = d\frac{x}{y} + d\frac{y}{x}$. Let $t = \frac{x}{y}$

and

and we have $abm + abnt = dt + \frac{d}{t}$ $\therefore abmt + abnt^2 = dt^2 + d$ $\therefore t^2 + \frac{abm}{abn-d} \times t = \frac{d}{abn-d}$ $\therefore$ □ *c* &c. gives $t =$

$$\sqrt{\frac{d}{abn-d} + \frac{a^2b^2m^2}{4\times abn-d)} - \frac{abm}{2abn-2d}} = ,23338 = 13^\circ\ 8'.$$

whence AE=20,9987 and AF=9,0893.

The 5 Queſt. (178) was anſwered by Meſſeurs *W. Bevil*, *W. Clarke*, *W. Eaton*, *Hen. Green*, *Tho. Hare*; and ſeveral other *Contributors*. But (then unobſerved by us) being a *ſtolen* Queſtion, we ſhall not chooſe to publiſh any *Solutions* to it, only the following REMARKS.

1 *Remark*, by Mr. *Timothy Drury*, of *Great-Houghton*, Yorkſh.

"*This* Queſtion is eſſentially the ſame as the firſt Queſtion in the *Ladies Diary* 1751, only the *Data* is a little *altered*; but the Method of Solution in every reſpect may be ſeen at large in the following *Diary*, and the Latitude brought out from thence is 74° 26′ 34″. And the Declination 11° 51′ 58″. W. W. R"

2 *Remark* by Mr *Thomas Bowen*, of BRISTOL.

This Queſtion is of the ſame Nature as Queſt 1ſt in *Ladies Diary* 1751, which is anſwered by its Propoſer Mr. *T. Cowper*, with the following

THEOREM. *As the Sum of the Sines of the Sun's aſcenſional Difference and Arch of Time from Day-break to Six o'Clock, is to the Sine of the Sun's Depreſſion at Day-break, ſo is the verſed Sine of the Arch of Time from Sun-riſe till Noon, to the Sine of the Meridian Altitude; and ſo is the verſed Sine of the Time from Midnight to Sun-riſe, to the Sine of the Sun's Depreſſion at Midnight.* And gives the Lat. 74° 26′ 33″. And the Sun's Declination 11° 51′ 58″.

3 REMARK. Mr. *Tho. Crabtree*, of *Colſion Baſſet*, alſo obſerves that the 5th *Queſtion* in our laſt Year's DIARY is taken *Verbatim* from the *Ladies Diary* 1751. And ſeems to reflect upon Mr. *Rowe* for his Imprudence in *pyrating* ſo ſoon, what he could not *expect* to eſcape *Obſervation*.

4 REMARK, by Mr. *Henry Green* of *Nottingham*.

——*This* Queſtion was firſt propoſed in the *Ladies Diary* 1751, and anſwered in 1752, where the Latitude is found 74° 26′ 34″, and the Declination 11° 51′ 58″. And from thence *pil'fered* by *Alexander Rowe* of *Penzance*.

So, on the Seas vile Slaves that will not ROWE,
Cut Captains Throats, and pyrating *they go.*

Mr.

Mr. *William Eaton* of *Sutton on the Hill*, in *Derbyshire*, and several other of our CONTRIBUTORS have made the like *Remarks*. Which we hope will have the desired Effect to deter Mr. *Rowe*, and *others*, from such *unfair* and *disagreeable* Practices.

6 Quest. (179) Answered by Mr. *Tho. Bowen* of *Bristol*.

Let s and c = Sine and cos. of the Sun's Altitude 48° 30′, b = cos. of the Sun's Amplitude = 24° 6; a = cos. of Azimuth from the North at second Observation 160° 12′. And x and y the Sine and cos. of the Latitude. Then (by *Spherics*) $xc - sya$ = Sine of the Sun's Declination $= by$. $\therefore \frac{x}{y} = \frac{b+sa}{c} = 1{,}3776209$ the Tangent of the Lat. 54° 1′ 23″. Hence the Sun's Declination is found = 13° 52′ 54″. The Time of Sun Rising 4h. 40′ 24″. Time of the second Observation 11h. 6′ 32″. And the Rate travelled at 3,107734 Miles per Hour.

The same answered by Mr. *Will. Kingston* of *Bath*.

Let x and y = Sine and Cos of the Lat. v and z = those of the Declination North, s = Sine 24° 50′, a and $-b$ = those of 160° 12′ the Azim. from the North, m and n = those of 48° 30′ the Sun's Altitude; and (by *Spherics*) $y : 1 :: v : \frac{v}{y} = s$; $v = sy$, and $mx - bny = v = sy$ from the above $\therefore mx = sy + bny$ $\therefore \frac{y}{x} = \frac{m}{s+bn}$ = Co-Tangent of the Lat. = 1,7177847 = 54° 19′ 48″, and $v = sy$ = 14° 10′ 35″ = the Declination; which answers in the Tables to the 28 of *Apr.* whence the Time of Sun-Rising is 4h 37′ 32″. And the Time when he ended his Journey 11h 6′ 20″. Then, as the Time from Sun-Rising 6h 28′ 48″, is to 20 Miles : : so is 1 Hour to the Rate = 3,211899 Miles per Hour.

Mr. *Tho. Robinson* of *Biddick* answers it thus.

Put Rad = 1. x and y the Sine and Cos of the Latitude; b the Sun's Amplitude at Rising; p and q the Sine and Cos. of the Sun's Altitude at the second Observation; z the Sun's Azimuth from the North (by *Spherics*) as $1 : b :: y : by$ = the Sun's Declination. Again $px - qyz = by$ $\therefore \frac{x}{y} = \frac{b+zq}{p}$ = 1,37761 = 54° 2′ the Tangent of the Latitude of the Place. Hence the Sun's Declination = 13° 52′ 31″ answering to the 27 Day of *April*. The Sun rose that Morning

ing 12 min. before 5 o'Clock; and he compleated his journey $6\frac{1}{2}$ min. after 11 of the Clock; and the Time he was in travelling the 20 Miles = 5h 54′ 30″. Which is at the Rate of 3,389 Miles an Hour. Q. E. D.

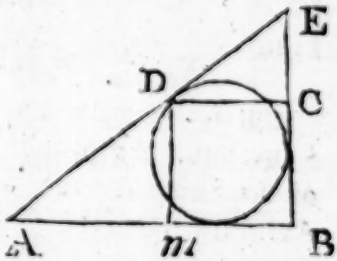
The ſame anſwered by Mr. *Tim. Drury* the Propoſer.

Here are given A ⊙ = 25° (24° 60′ which is an Error of the Preſs) whoſe Sine put = q; Z ⊙ 41° 30′ Sine and Coſine s and c, and the Angle PZ ⊙ = 160° 12′, and let x and y = Sine and Coſine of the Latitude; then (by *Spherics*) qy = Coſine of P⊙, and $cx - say$ = Cos. P⊙ ∴ $cx - say = qy$; but $x = \sqrt{1-y^2}$, whence, $c\sqrt{1-y^2} = qy + say$; ſolved, $y = \sqrt{\frac{c^2}{q^2 + 2saq + s^2a^2 + c^2}} = ,582146$. Hence the Latitude is 54° 23′ 54″ 10‴. And the Day of the Month was the 28th of *April*, and the Rate travelled per Hour = 3,0769 Miles. W. W. R.

Meſſrs. *Bevil*, *Clark*, *Hare*, *Hartley*, *Holroyd*, *Hudſon*, *Meſhan*, and *others*, ſent us Solutions nearly agreeing with the above; but as ſeveral of them did not bring out the Number we chooſe to omit their Publication, and proceed to the Solution of the

7 Queſt (180) Anſwered by Mr *Thomas Crabtree* of *Colſhaw Baſſet*.

Let 20,2825 = a, 3x = BE; 4x = AB, and 5x = AE; alſo 2x = the Circles Diameter, put y = Dm = Bm ∴ 4$x - y$ = Am; and by ſimilar Triangles we have, as 4x : 3x :: 4$x - y$: y Conſequently $4xy = 12x^2 - 3xy$; or $7xy = 12x^2$. Therefore $y = \frac{12x^2}{7x} = \frac{12x}{7}$. And (by Queſt) $\frac{2x^2}{9} = a$; reduced x comes out 10; and the Sides are 30, 40, and 50 reſpectively.



The

The same answered by *Henry Green*, of *Nottingham*.

Let $3x$=BE (see last Fig.) $4x$=AB, and $5x$=AE, a=20,2825; also m=,7854, and $2x$=the Diameter of the Circle; and as the Side of the inscribed Square is known to be $\frac{AB \times BE}{AB+BE} = \frac{12x}{7}$; consequently we have the following Equation $4x^2 \times m \frac{144x}{49} = a$, which properly reduced gives $x = \sqrt{\frac{49a}{196m-144}} = 10$. And the Sides are found =30, 40 and 50. W. W. D.

The same answered by Mr. *Jos. Scott* of *Cawthorne*.

If any right angled Triangle whose Sides are in *Arithmetical Progression*, the Diameter of its inscribed Circle and the Sides are in Proportion as 2, 3, 4 and 5, respectively; let a = Area of Unity, b=the Difference of the Areas of the inscribed Circle and the inscribed Square; and $2x$=the Diameter of the inscribed Circle; then the Legs will be $3x$, and $4x$; but $\frac{12x^2}{7x}$, or $\frac{12x}{7}$ = the Side of the inscribed Square; and $\frac{144x^2}{49}$ = its Area; and $4ax^2$ = Area of the Inscribed Circle $\therefore 4ax^2 - \frac{144x^2}{49} = b$; reduced $x = \sqrt{\frac{49b}{9,9384}}$ = 10. Whence the Sides are 30, 40, and 50.

The same answered by Mr. *Tho. Harris*, of *Bugbrook*, near *Northampton*.

Put $3x$ = the lesser Side, and $4x$ = the greater; then 3,1416 $\times xx$ = the Area of the inscribed Circle, and $\frac{144xx}{49}$ = the Area of the inscribed Square $\therefore$ 3,1416 $- \frac{141xx}{49}$ =20,2825 Reduced x = 10, whence the Sides are 30, 40, and 50. And the Area 600. Q. E. F.

The same answered by Mr *Will. Eaton*, of *Sutton on the Hill*, in *Derbyshire*.

It may be easily demonstrated by the Condition of the Quest. that the Sides of the Triangle are in the Ratio of 3, 4 and 5. Therefore put $3x$, $4x$, and $5x$ = the several Sides of the Triangle, then, by two known *Theorems* 2x will

will be = the Diameter of the inſcribed Circle, and $\frac{12x}{7}$ = the Side of the inſcribed Square $\therefore 4x^2b$ = the Circle's Area (b being =,7854) and $\frac{144xx}{49}$ = the Square's Area and by Queſt. $4x^2b - \frac{144x^2}{49} = 20,2825 \therefore x = \sqrt{\frac{20,2825}{4b - \frac{144}{49}}} = 10 \therefore$ the Sides are 30, 40, and 50; and the Area = 600.

Meſſeurs *Bowen*, *Drury*, *Hare*, *Hartley*, *Holroyd*, *Hudſon*, *Reeves*, *Robinſon*, and other *Contributors*, favoured us with good Solutions to this Queſtion, but Room will not permit us to publiſh any more at large.

8 Queſt. (181) Anſwered by Mr. *J. Hudſon*, of *Louth*, Lincolnſhire.

By the Problem the Farmer muſt either pay 500*l.* down, and 35*l.* half yearly; or 60*l.* half yearly and nothing preſent. Now put $a = 35$, $b = 60$; $r = 1,05^{\frac{1}{2}}$ (= the Amount of 1*l.* for half a Year) and $n = 42$ (the Number of half yearly Payments) then by Caſe 1 pag. 14 of *Sherwin*'s Math. Tables, we get $\frac{a}{r-1} - \frac{a}{r^n \times r - 1} = 911,886l.$ (for the preſent Worth of all the half yearly Payments) to which add 500*l.* paid down, and it gives 1411,886*l.* for the preſent Value of the Leaſe in this Caſe. But, $\frac{b}{r-1} - \frac{b}{r^n \times r - 1}$ = 1557,611 (for the preſent Value when nothing is paid down) Conſequently the Farmer, by paying the Depoſit, will be a Gainer of 145,725*l.* or 145*l.* 14*s.* 6*d.*

Mr. *Tho. Bowen*, of *Briſtol*, ſent us the following Solution.

The Amount of an Annuity of 24*l.* payable half yearly, at 5*l. per Cent. per ann.* Compound Intereſt for 21 Years is found (by a well known Theorem) = 1735,694688 Pounds, the Value of the firſt Offer at the End of the ſaid Time. Now, the Amount of 14*l. per annum*, on the ſame Terms as the former for 21 Years = 1012,488568 Pounds; to which 278,596*l.* &c. (the Amount of 100*l.* for ſame Time at 5 *per Cent. per ann.* Comp. Int.) being added, their Sum will

will be found = 1291,084827, the Value of the ſecond Offer. Hence it appears the Farmer will ſave at the End of 21 Years by taking a Leaſe of 24 Acres of Land, according to the ſecond Offer 444,609816 Pounds. Therefore by taking 48 Acres on ſame Terms, he will ſave 889,219-22 Pounds; and by 120 Acres 2223,049305 *l.* So that the ſecond Offer is moſt advantageous for the Farmer, and the whole Sum ſaved by him at the Expiration of the Leaſe will be found = 3556,878888, or 3556*l.* 17*s.* 7*d. fere.*

The ſame anſwered by Maſter *William Clarke*, of Mr. *Wildbore's* School, at *Watnall*, near NOTTINGHAM.

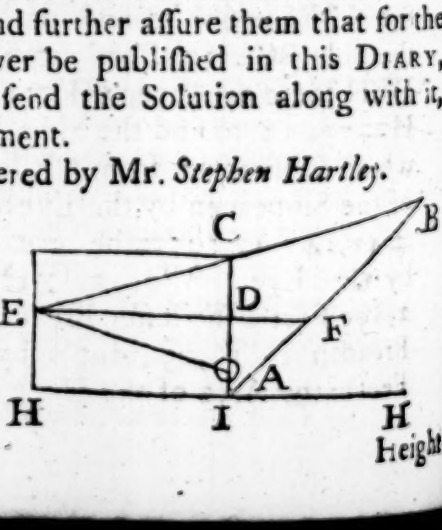
As the Farmer is to be allowed Compound Intereſt for his Money paid down; he ſhould eſtimate his half yearly Savings at the ſame Intereſt: and therefore the Difference betwixt the Amount of 42 half yearly Payments of 5*l.* each, and the Amount of 100*l.* in 21 Years, will be the Sum ſaved by the firſt Offer, and ſo of the reſt; whence the following SOLUTION.

The Amount of 100*l.* in 21 Years at 5 *per Cent. per Ann.* Compound Intereſt is 278,5963 *l*: the Amount of 20*cl* in that Time is 55,7,2; and that of 50*cl* is 1393*l.* the Amount of 42 half yearly Payments of 5*l.* each at the ſame Rate of Intereſt is 361,6, the ſame Number at 10*l* each, is 723,2, and at 25*l.* each 1808*l* Conſequently by the firſt Offer he will gain 83*l*; by the ſecond 166*l.* and by the third 415*l.* The preſent Value of the firſt Offer is 29,7833, of the ſecond 59,5666; and of the third 148,9165*l.*

As we received but few Solutions to this Queſtion, and the Propoſer Mr. *J. Cheſter* not ſending his own *along with it*, according to the Advertiſement; we leave the above Differences to the Conſideration of our mathematical Contributors the next Year; and further aſſure them that for the future no Queſtion ſhall ever be publiſhed in this DIARY, unleſs the Propoſer ſhall ſend the Solution along with it, agreeable to the Advertiſement.

9 Queſt (182) Anſwered by Mr. *Stephen Hartley*.

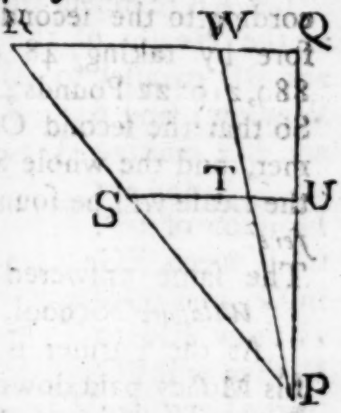
Let H, H, repreſent the Horizon, I B the Slope; by the *Data* given, and plane *Trigonom.* (ſuppoſing E the Height of the Obſerver's Eye, C O the



Height

Height of the Window. BA the Length of the Slope *ſeen*, and EF the Horizontal Diſtance of the Eye from the Slope) I find AB=32,12102. and DF=9,4663 Feet.

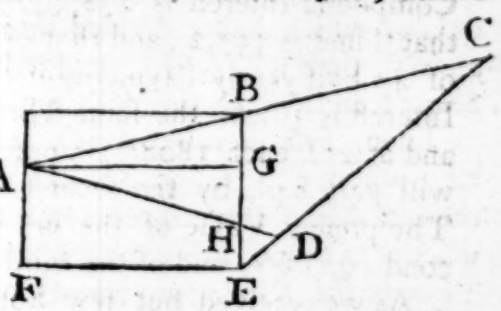
Again, (Fig 2) let TU = ½ the Breadth of the Pier, ST the Breadth of the Window; and PU the Diſtance of the Obſerver therefrom; alſo PQ = FE (Fig. 1) ſince RQ muſt be parallel to SU; we have PU : SU : PQ : QR = 8,7598 Feet. Again, as PU : TU : : PQ : QW = 2,9199 Feet But QR — QW = 5,8399 = the Breadth of the Slope ſeen through one Window



∴ 2 × 5,8399 × 32,12102 is = 375,1671 Feet, the Area required.

Mr. *J. Holroyd* anſwers it thus.

Let ABCDEF repreſent a Plane paſſing through the Eye and perpendicular to the fartheſt Side of the Houſe, and likewiſe to the Slope on the Outſide of the Room; alſo let AG=10=the Breadth of the Room AF = 5½ the Height of the Eye; likewiſe BE=8½ = the Height of the Top of the Window from the Floor; and BH = 6 = the Height of the Window; alſo BG=3. Then, by *Trigon.* I find the <BAG = 16° 42′. And likewiſe the Side AB=10,44. Alſo in the ΔBCE there are given BE=8½, the <CBE=106° 42′, and the <BEC=60° to find the Side EC=35,37 Feet, as alſo the Side BC=32 Feet nearly. Likewiſe in the Triangle DEH there are given HE=2,5 and the Angles E=6° and H=73° 18′ to find the Sides HD=2,975, and DE=3,29; which ſubſtracted from CE leaves DC=32,8=the Length of the Slope ſeen by the Eye: then as AB=10,44 : 3 : : AC =42,44 : 12,195=the greater Breadth of the Slope ſeen by the Eye. Alſo, as AH=10,44 : 3 : : AD=13,415 : 3,855 Feet = the leſſer Breadth, which added to the greater Breadth is 16,05; and × by the Length gives 514,884 Feet=the Area of the Slope required.

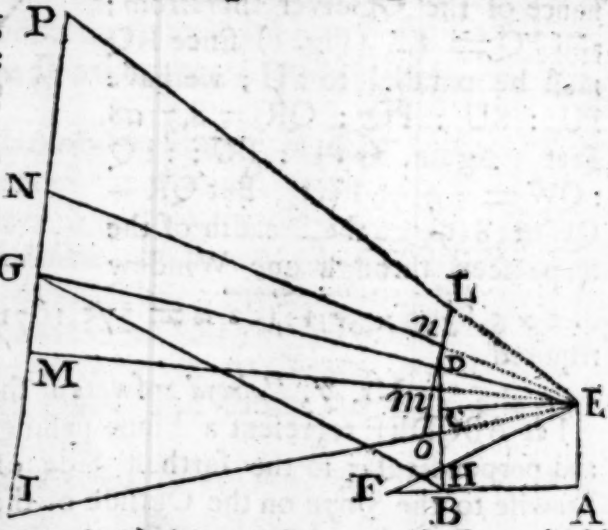


The

The ſame anſwered by Mr. *William Kingſtone*, the Propoſer.

CONSTRUCTION.

Let AB repreſent the Floor of the Room = 10 Feet, AE = the Height of the Eye = $5\frac{1}{2}$; draw EC parallel to AB, and BD parallel to AE, make BH = $2\frac{1}{2}$ the Stool of the Window; and BD = $8\frac{1}{2}$ the Height; through D draw EG; and BG making an < with the Horizon of 30°, till it meets EG in G; and thro' H draw EH to F, then will FG be the Length of the Slope, ſeen by the Eye thro' D; draw OL at right Angles to ED, and thro' G draw IP parrallel to OL, which being divided into three equal Parts in M and N then will NPL*n*, and MIO*m*, be the Parts of the Slope ſeen through the Window.



Then, firſt in the △EHC, is known EC = 10, and HC = 3 whence is found <CEH 16° 42′, and EH = 10,44; then in △BHF, are known all the Angles, and Side BH, whence is found HF = 2,26; and FH + EH = EF = 12,70. Then in the <EFG are known all the Angles and Side EF, whence is found FG = 30,31 the Length of the Slope; whence the whole Area of the Trapezium IPLO may be found = 589.5, two thirds of which is 393 Feet, may be ſeen out of the Window.

10. Queſt (183) Anſwered by Mr. *Henry Green*.

By a few Trials I find x between 6 and 7, but nearer the former; therefore I ſuppoſe it 6,42 and find the Error 1874 too little. Again I aſſume it a ſmall matter more, *viz.* 6,43, and the Error is 2108 too much. Then, as the Sum of the Errors: to the Diff of Supp.:: the latter Error: 6,42941, which is rather too much; but by repeating the Operations the Value of x may be found to any Degree of Exactneſs.

The ſame anſwered by Mr. *Tho. Crabtree*.

By a few Trials, and a Table of Log. I find x between 6 and 7, but neareſt to 6. Therefore let it = 6,4, which is rather

rather nearer, then by the Rule given by Mr. *Dönn* in GENT. DIARY 1752. I find $x=6,42$ rather nearer; and by another Operation or two x will be found true to 6 or 7 Places of Decimals.

Mr. *William Clark* ſolves it as follows.

Let $6+v=x$, then $\overline{6+v}^{6+v}=\frac{a^x}{6+v}-a$ and $\overline{6+v}^{7+v}=a^x-6a-av$, $a^x-ba=b$. Then $6^{7+v}\times\overline{1+\frac{v}{6}}^{7+v}=6^{7+v}\times 1+\overline{7+v}\times\frac{v}{6}+\overline{\overline{7+v}\times\overline{6+v}\times v^2}+$ &c. and becauſe any Expreſſion r^{p+s} may be reduced to $r^p\times 1+s\times L:r+\frac{s\times L:r)^2}{2}+\frac{s\times L:r^3}{2.3.}$ &c. $\therefore$ by putting $m=$Hyp. Log. of 6 we have $6^{7+v}=6^7\times 1+mv+\frac{m^2v^2}{2}+\frac{m^3v^3}{2.3.}+$ &c. $\therefore$ the given Equation may be thus expreſſed $6^7\times 1+\frac{7+v\times v}{6}+\frac{7+v\times 6+v\times v^2}{72}$ &c. $\times 1+mv+\frac{m^2v^2}{2}+\frac{m^3v^3}{2.3.}$ &c. $+av=b$. This being abbreviated and reverted gives $v=,42241$, and conſequently $x=6,42241$. W. W. R.

N. B. v muſt be leſs than Unity, otherwiſe the Series will not converge.

Meſſeurs *Drury*, *Hartley*, *Meſhan*, *Robinſon*, and others, ſent Solutions to this Queſtion, all upon the ſame Principles as the two firſt before inſerted, we ſhall therefore omit their Publication, and proceed to

11. Queſt. (184) Anſwered by Mr. *W. Bevil*, of *Harpwell*.

Given $\overline{x^{\frac{1}{3}}\overline{x^{\frac{3}{4}}x^{\frac{1}{1}\frac{2}{5}}}}$ to be a *Maximum*, then it is evident that $\overline{x\overline{x^{\frac{1}{1}\frac{2}{3}}}}=x^{x^n}$ muſt be a *Max.* put $z=$ the Hyp. Log. of x^m. Therefore zx^n will be a *Max.* which in Fluxions is $\dot{z}x^n+nx^{n-1}z\dot{x}=0$, whence $z=x^m=-\frac{m}{n}$; and the Hyp. Log. $x=-\frac{1}{n}=-1,25$; this multiplied by 4342948

 give

gives the common Negative Log. $= -,3428685$; whence we find $x = ,28651 = 5\,s.\ 8d.\ \frac{3}{4}$ nearly.

Mr. *Tho. Harris*, of *Bugbrook*, solves it thus.

Reduce the Expression to $x^{\frac{1}{3}}$ its equal, then put $z =$ Hyp. Log. of $x^{\frac{1}{3}}$ and $n = \frac{36}{120}$; then its Log. zx^n is also a *Max.* which thrown into Fluxions and reduced, gives $z = \frac{-1}{n} = \frac{-36}{120} = 3{\cdot}3333$, &c. = Hyp. Log. of $x^{\frac{1}{3}}$ $\therefore -1,1111$, &c. = Hyp. Log. of x whose Number is found $,4219$, &c. $= 8\,s.\ 5d.\ \frac{1}{4}$. Q. E. F.

Mr. *Tho. Robinson's* Solution to the same.

Given $x^{\frac{1}{3}}$ $= x^{\frac{1}{3}}$. Put $z =$ Hyp. Log. $x^{\frac{1}{3}}$; and $n = \frac{36}{120}$ then will the Log. of $zx^n =$ a *Maximum* by Quest. which in Fluxions is $x^n\dot{z} + nzx^{n-1}\dot{x} = 0$. But according to Log. $\dot{z} = \frac{\dot{x}}{x}$. This substituted in the last Equation is $x^{n-1}\dot{x} + nzx^{n-1}\dot{x} = 0$. Or, it may he thus, $nzx^{n-1} = -x^{n-1}$ $\therefore z = -\frac{1}{n} = \frac{120}{36} = 3{,}333333$, &c. the Hyp. Log. of $x^{\frac{1}{3}}$, and therefore 1.111111, &c. is the Hyp. Log. of x, which answers to $0{,}30357$ Parts of a Pound $= 6s\ 0\frac{3}{4}$.

Mr. *Alex. Rowe* the *Proposer's* own Solution, is as follows.

First of all reduce the Expression to $x^{\frac{1}{3}}$ its Equal. Then put $z =$ Hyp. Log. of $x^{\frac{1}{3}}$, and $n = \frac{36}{120}$. Then it's Log. zx^n is also a Maximum, which fluxed is $x^n\dot{z} + nzx^{n-1}\dot{x} = 0$. But $\dot{z} = \frac{\dot{x}}{x}$; $\therefore x^{n-1}\dot{x} + nzx^{n-1}\dot{x} = 0$. Reduced, $z = \frac{-1}{n} = \frac{-120}{36} = -3{,}3333$, &c. = Hyp. Log. of $x^{\frac{1}{3}}$ $\therefore -1,1111$, &c. Hyp. Log. of x; whose natural Number is $,32919$, &c. $= 6s.\ 7d.$

We received several other Solutions to this Question, which we shall omit publishing; only this *Remark* by Mr. *Drury*, viz. that it is the same with one proposed in *Martin's Magazine*, some time ago.

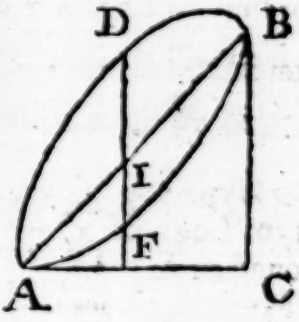
12. Quest. (185) Answered by Mr. *W. Kingston*.

Given $10bae - 5be^2 = 5a^3$; or $2bae - be^2 = a^3$; the Fluxion of which is $2ba\dot{e} - 2b\dot{e}e + 2be\dot{e} = 3a^2\dot{a}$ $\therefore 2bae - 2be =$

$3a^2\dot{a} - 2be\dot{a} \therefore \dot{e} = \frac{3a^2\dot{a} - 2be\dot{a}}{2ba - 2be} = 0 \therefore 3a^2\dot{a} - 2be\dot{a} = 0 \therefore$
$3a^2 - be = 0 \therefore e = \frac{3a^2}{b} \therefore e^2 = \frac{9a^4}{4b^2}$ these put for e, and e^2 in the Equation of the Curve gives $3a^3 - \frac{9a^4}{4b} = a^3 \therefore$
$2a^3 = \frac{9a^4}{4b} \therefore 8b = 9a \therefore a = \frac{8b}{9}$ $a^2 = \frac{64b^2}{81}$, $a^3 = \frac{512b^3}{729}$.
These Values of a, and a^3 being put above, gives $\frac{16b^2e}{9} = -\frac{512b^2}{729}$, $\square$C gives $e^2 - \frac{16be}{9} + \frac{64b^2}{81} = \frac{64b^2}{81} -$
$\frac{512b^2}{729} = \frac{64b^2}{729} \therefore e - \frac{8b}{9} = \frac{8b}{27} \therefore e = \frac{8b}{9} + \frac{8b}{27} = \frac{16b}{27}$ or $\frac{32b}{27}$ that is $a = 10\frac{2}{3}$; and $e = 7\frac{1}{9}$, or $14\frac{2}{9}$; from whence the Curve may be conſtructed.

The ſame anſwered by Mr. *William Betvil.*

Given $10bae - 5be^2 = 5a^3$; or $2bae - be^2 = a^3$, where $b = AC$, $a = AF$, and $e = FI$ or FD, ſee the Fig. annexed. But let $x = a$, and $y = e$; then $2bxy - by^2 = x^3$, whence $y = x \pm \sqrt{1 - \frac{x}{6}}$; therefore $y\dot{x} =$ $x\dot{x} \pm x\dot{x}\sqrt{1 - \frac{x}{6}}$; the Fluent of



which is $xy = \frac{a}{2} \pm \frac{\overline{1-\frac{x}{6}}^3 \times -\overline{6x-4b}^2}{15}$, and corrected gives $\frac{x^2}{2} + \frac{\overline{1-\frac{x}{6}}^{\frac{3}{2}} \times -\overline{6x-4b}}{15} + \frac{4b^2}{15}$ for the Area of ADF and $\frac{x^2}{2} - \frac{\overline{1-\frac{x}{6}}^{\frac{3}{2}} \times -\overline{6x-4b^2}}{15} - \frac{4b^2}{15}$ for the Area of AIF. Now, when $x = b$; then $\frac{b^2}{2} + \frac{4b^2}{15} = \frac{23b^2}{30} =$ Area of ADBC; and $\frac{b^2}{2} - \frac{4b^2}{15} = \frac{7b^2}{30} =$ Area of AIBC;

then $\frac{23b^2}{30} - \frac{7b^2}{30} = \frac{16b^2}{30} = \frac{8b^2}{15}$ = Area of ADBI, as required.

The ſame anſwered by *Tabularius*.

Let AV = AC = b, Vb = a, BD or Bd = e; and write x for a, and y for e; then the given Equation will become $2bxy - by^2 = x^3$ $\therefore y = x \pm x\sqrt{1 - \frac{x}{b}}$ from which it appears that x cannot be greater than b, and when $x = by = b$ alſo; and making the Fluxion of $x \pm x\sqrt{1 - \frac{x}{b}}$ equal to nothing we get $y = \frac{32b}{27}$, when $x = \frac{8b}{9}$; $\therefore$ the Curve returns to itſelf touching AC in the Point C, and becomes convex towards AV. The Fluxion of the Area is $y\dot{x}$ $= \dot{x}x \pm \dot{x}x\sqrt{1 - \frac{x}{b}}$ put $1 - \frac{x}{b} = v$,

then will $\pm \dot{x}x\sqrt{1 - \frac{x}{b}} = \pm b^2 v^{\frac{3}{2}}\dot{v} \pm b^2 v^{\frac{1}{2}}\dot{v}$, and the Fluent is $\pm \frac{2b^2v^{\frac{5}{2}}}{5} \pm \frac{2b^2v^{\frac{3}{2}}}{3}$ $\therefore$ the correct Fluent is $\frac{x^2}{2} \pm 2b^2 \times \frac{1-\frac{x}{b}^{\frac{5}{2}}}{5} - \frac{1-\frac{x}{b}^{\frac{3}{2}}}{3} + \frac{2}{15}$ = the general Area: Hence $4b^2 \times \frac{1-\frac{x}{b}^{\frac{5}{2}}}{5} - \frac{1-\frac{x}{b}^{\frac{3}{2}}}{3} + \frac{2}{15}$ = any variable Area VDdV; and when $x = b$, the Area VDCAV $= \frac{23b^2}{30} = 110{,}4$ Square Poles, the Area VdCAV $= \frac{7b^2}{30} = 33{,}6$, and the Area VDC$d$V $= \frac{8b^2}{15} = 76{,}8$.

CONSTRUCTION.

Draw VC interſecting BD in O, and take OD = Od = VB$\sqrt{1 - \frac{VB}{VA}}$; then will the Points D, d, be in the Curve;

for

for BD being parallel to AC, and AC = AV ∴ BO = BV, and conſequently VC will always biſſect Dd.

CORROLARY.

The Fluxion of $2x\sqrt{1-\frac{x}{b}} = Dd$ made equal to Nothing, gives $Dd = \frac{4b}{3\sqrt{3}}$ (a Maximum) when $x = \frac{2b}{3}$.

To the AUTHORS of the GENTLEMAN'S DIARY.

GENTLEMEN,

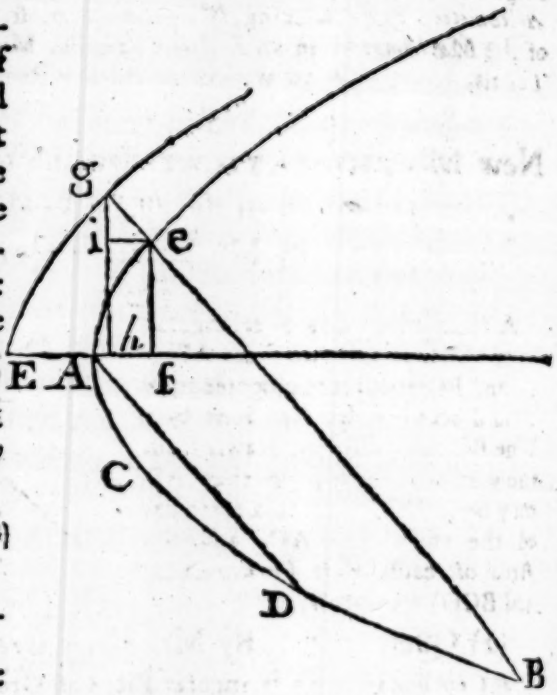
As the *Solutions* publiſhed in your laſt DIARY, to *Queſtions* 169 and 172, ſeem to *me*, very unſatisfactory; and it having been ſaid, that thoſe *Queſtions* were not *properly* propoſed; I have here ſent you my own *Solutions*; and ſhould be glad to ſee them inſerted (if poſſible) in the next Year's DIARY; as you know the Reaſon of their not being ſent laſt Year, I have no Occaſion to ſay any thing on that Head now; I was not without Hopes however, that ſome other of your Contributors might have given them better Anſwers than I myſelf was able to do; but, as I do not find that to be the Caſe, have ventured to offer my own; which, though they will not admit of elegant Concluſions, are (I preſume) built upon undeniable Principles,

Graiſley, *June* 8, 1758. From your very humble Servant C. WILDBORE.

(169) Let A and B repreſent the two Lamps on one Side the Street, and C that on the other; from the angular Point C, draw CE, making any given Angle with CB, and let D be the darkeſt Point in this Line; then, it is evident that any Number of Points in the required Curve may be determined by taking different Values of the Angle ECB, the Point D being firſt determined in any one Poſition. To effect which, put CB = a, CA = b; c = the Coſine of BCD, m = that of ACD, and v = CD; then will $AD^2 = b^2 + v^2 - 2bvm$, and $DB^2 = a^2 + v^2 - 2avc$; and becauſe Light varies in the reciprocal duplicate Ratio of the Diſtances from each Lamp we have $\frac{5}{a^2+v^2-2vca} + \frac{4}{b^2-v^2-2mbv}$ for the Strength of the Light at D, a *Minimum*, the Fluxion of which divided

by $\dot{v}$ gives $\frac{12}{v^3} + \frac{10v - 10ca}{\overline{a^2 + v^2 - 2ca}^2} = \frac{8mb - 8v}{\overline{b^2 + v^2 - 2mb}^2}$ which determines v; and consequently by taking different Values of c, not only so many different Points in the Curve may be found, but the Length of the *Track*, that the Person must describe, may also be approximated to any Degree of Exactness.

(172) Let E represent the Place of the English Ship, and A that of French at the Beginning of the *Chace*. Put a = the Parameter of the Parabolick Curve, v = Af, y = ie; EA = ge = b; then will $\sqrt{av}$ = ef $\sqrt{b^2 - y^2} + a^{\frac{1}{2}} v^{\frac{1}{2}}$ = gh; and $v - y + b$ Eh; $\frac{-y\dot{y}}{\sqrt{b^2 - y^2}} + \frac{a^{\frac{1}{2}}\dot{v}}{2\sqrt{v}}$ = gh's Fluxion, and $\dot{v} - \dot{y}$ = Eh's Fluxion; but by the Question Eh's Fluxion square + gh's Fluxion squared = $\frac{25}{16} \times \overline{\text{Af Flux}}^2 + \overline{\text{ef Flux}}^2$



Whence $\frac{b^2\dot{y}^2}{b^2 + y^2} - \frac{a^{\frac{1}{2}}y + 2v^{\frac{1}{2}}\sqrt{b^2 - y^2}}{v^{\frac{1}{2}}\sqrt{b^2 - y^2}} \times \dot{v}\dot{y} - \frac{9}{10} \times \overline{\dot{v}^2 + \frac{a\dot{v}^2}{4v}} = 0$. From which Equation y may be found in Terms of v, by the known Method of Substitution and Comparison.

We once more return Thanks to our worthy and ingenious *Contributors*, for the Assistance and Encouragement they give in this Undertaking; desiring (as before) that they will please to send us *Things* entirely new; and also, that their *Schemes* may be drawn as perfect as possible, and of a proper *Size* for the DIARY; as well as to bring out all their *Equations* in *Numbers*, &c. in order to facilitate the Labour of the Authors in collecting and compiling the Work. And further (as several

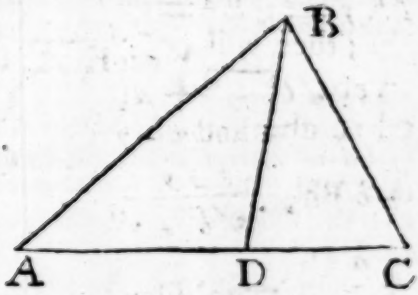
everal Letters come too late in every Year to be possibly inserted, or even mentioned in the *Catalogue*) hope they will for the future take Care that they be sent soon enough to come to hand before the first Day of *May* in every Year, directed for the Authors of the GENTLEMAN's DIARY, to be left with THOMAS PEAT, *Schoolmaster*, in *Nottingham* (Post paid.) NOTTINGHAM, 9th *June*, 1758.

Thomas Peat, Writing Master, Accomptant, and Surveyor, is removed from *Castlegate*, to a large and commodious House in *Cartergate*, Nottingham; where he continues his School as usual, and teaches *Writing*, *Arithmetic*, Book-keeping, &c. and the most useful and practical Parts of the *Mathematics*, in an easy and familiar Method, and upon reasonable Terms. With whom Youth may Board.

New MATHEMATICAL QUESTIONS proposed to be answered in the next Year's DIARY.

(1) Quest. 186. By Mr. THOMAS CRABTREE, of *Coalsten Basset*.

A Gentleman has a triangular Field ABC whose two Sides AB=30, and BC=20; it is proposed to be divided between his two Sons by a Line BD=15 Chains, drawn from the vertical Angle; so that AD may be to DC: as 3 to 2; required the third Side AC, and the Area of each Part (*viz.* ABD, and BCD) separately.



(2) Quest. 187. By Mr. *Henry Green*, of *Nottingham*.

A Gentleman has a triangular Piece of Ground, whose Sides are 30, 40 and 50 Chains respectively; in which there is a circular Pond that touches the three Sides of it: Now, he is minded to put the Remainder of the Land to particular Uses; and desires to know the Areas of the three Pieces at each Angle separately.

(3) Quest. 188. By Mr. *Thomas Robinson*, of *Biddick*, near *Durham*.

In what Northern Latitude, Day of the Month, and Time of the Day in the Year 1758; the Sun being due East, so that the Time from 6 o'Clock, is equal to the Sun's Declination; and also the Latitude of the Place is equal to the Sum of them both?

(4) Quest. 189. By Mr. *William Clark*, of *Watnall*, Nottinghamshire.

Given the Difference between the Sun's Altitude at 6, and Azimuth =56° 42′, and the Sun's Declination=23° 29′. *Quere* the Latitude of the Place by a simple Equation?

(5) Quest. 190. By *Tabularius*.

Given the Radius (=20) of three equal Circles touching each other to determine the greatest Parallelogram that can be described in the curvineal Triangle composed of the three Arcs intercepted between the Points of Contact?

(6) Quest.

(6) Quest. 191. By Mr. *J. Hudson*, of *Louth*, Linc.

In what Latitude *North*, and on what Days of the Year 1759, when the Sun riseth half an Hour past 5 o'Clock, will the Degrees of his Co-Declination exceed those of the Latitude, by the greatest Quantity possible?

(7) Quest. 192. By Mr. *Henry Green*, of *Nottingham*.

Two Persons A and B, bought an Hay-Rick, which we will suppose in the Form of a *Paraboloid* whose Diameter is = 30 Feet, and Altitude = 40. And it is to be divided betwixt them by a Line drawn parallel to the Axis thereof; What is the Difference of the Solidities, when the Height of the Section is 28 Feet?

(8) Quest. 193. By Mr. *Tho. Crabtree*, of *Coulston-Basset*.

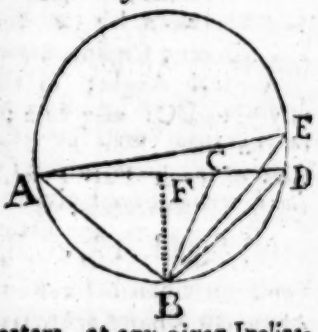
Given $y^4 - xy^2 = x^3$, an Equation expressing the Nature of a Curve, to find the Abscissa and Ordinate thereof, when the Arc is given = 10637,745.

(9) Quest. 194. By *Astronomus*.

It is required to determine (by a *simple* Equation) where a Body must be placed in a right Line connecting the Centres of the Moon and Earth so as to be the least subject to their joint Attraction.

(10) Quest. 195. By Mr. *Zach. Gaskell*.

In the Circle ABD, there is given the Chord AB = BD = b; AD = 10. It is required to determine the Diagonal BE so that AE + ED shall be = AB + BD; and to find the Point E by a geometrical Construction.



(11) Quest. 196. By *Astronomus*.

If a given frustum of a Cone, of solid Gold, or other Metal, be supported at the Extremes of its Axis; it is required to find the Stress, or Pressure upon each of the Supporters, at any given Inclination of the Axis to the Horizon; and to give the Investigation.

(12) Quest. 197. By *Tabularius*.

In the Latitude of 53° 15′ stand two remarkable Towers, whose Distance from each other is equal to the Height of the highest Tower; on the last Day of *May* 1757, at 6 in the Morning, I observed the Summits of the said Towers in a right Line with the Sun's Centre; and at 10, the same Forenoon, the Distance between the Extremities of their Shadows was equal to 85,666 Yards on the horizontal Plane; what is the Height of each Tower?

(13) Quest. 198. By Mr. *Zach. Gaskell*.

Required the Dimensions of the greatest Ellipsis that can possibly be inscribed in a Semicircle whose Diameter is 2 Feet.

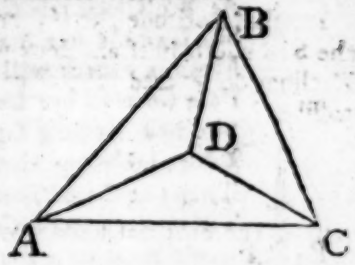
(14) Quest. 199. By Mr. *Tho. Moss*, of *London*.

To find six Values of x, in whole Numbers, so as to bring out, with each of those Values, the Expression $3\sqrt{\frac{323x+30361}{7107}}$ a whole Number.

(15) Quest.

(15) Queſt. 200. By Mr. *Charles Wildbore.*

If three Lines be drawn from the three Angles, to meet in a Point (D) within a plain Triangle ABC; it is propoſed to determine, by a *Synthetical* Method, the general Relation of theſe Lines, when $\overline{AD}^{\pm n} + \overline{CD}^{\pm n} + BD^{\pm n}$, is a Maximum.



ANSWERS to the ÆNIGMAS in the laſt Year's *Diary*.

1. Latin, A WEDDING RING.

2 A LACE.
3 THE FIGURE 8.
4 A SAW.
5 A GARLAND.
6 AN ADVERTISEMENT.
7 The GENTLEMAN'S DIARY.
8 MISFORTUNE.
9 A Garden ROLLING STONE.
10 A FIDDLESTICK.
11 A DIE.

Mr. *Tho. Harris*, of *Bugbrook*, near *Northampton*, ſent us the following Anſwers to all the *Ænigmas*. Old *Darby's* WILL.

My deareſt *Joan* I muſt be gone! I can no longer ſtay;
But leave this Earth for want of Breath, and be transform'd to Clay.
My SAW and *Sieve* to you I give; my *blacking Balls* and LACE, 4. 2.
The *Pins* and *Blue* I give to you I bought at yonder Race.
My FIDELESTICK, and little *Rick* of *Hay*, near *half an Hundred* 10.
A GARLAND *green* as e'er was ſeen, at which Folks often wonder'd. 5.
Two batter'd *Quoits* like FIGURE 8, beſide the GENTLEMAN'S DIARY; 3. 7.
A little DIE your *Luck* to try; and ROLLING STONE to tire ye'. 11. 9.
A *little Book*, a *Tenter Hook*, and printed ADVERTISEMENT: 6.
A *Quack's* Receipt when you can't eat, may give you good Adviſement:
And ſince I lie at point to *die*, don't weep nor wail nor ſhiver;
MISFORTUNES fall to great and ſmall: there's none can live for ever! 8.

Mr. *F. F. Mingle* ſent us All the *Ænigmas* anſwer'd in a ſhort *Sketch* of the *Compariſon* between a compleat *Gentleman*, and the modern *Fribbles* of the Age.

How different is the Character of a compleat *Gentleman* to that of the *Fribble!* the *one* generally riſes before 8, and improves his Mind with peruſing ſome good BOOK, or taking a Walk (if the Weather permit) for the Benefit of his Health; while the *other* will be ROLLING a Bed till Noon! the *firſt* takes a Pleaſure in the Exerciſe of good Senſe and Reaſon (inſtead of a foppiſh Dreſs) in good Company, and for the Advantage of his Family, or the Service of his Country; while the other only minds flouriſhing his LACE'd *Coat*, *Ruffles* and RING'S; having his Head ſurrounded with PAPER and *Curls* to make it look as *trim* as a GARLAND; will ſpend whole Nights at the DICE, tho' he may have the MISFORTUNE to loſe his *All*; or fool his *Time* and *Money* away, in the *ſee* SAWing Motion of a FIDDLESTICK.

All

All the *Ænigmas* answer'd by *Random, Junior.*

At 8 o'Clock fair *Chloe* roſe from Bed: 3
She LACE'd her Stays, and then She dreſs'd her Head: 2
MISFORTUNES will attend the beſt we know, 8
Poor *Chloe* to her Loſs ſoon found it ſo!
She had not long ſat on the ROLLING STONE 9
Before her Ring, her WEDDING-RING! was gone: 1 Lat.
Then thro' the Town ADVERTISEMENTS were carry'd. 6
Till now, a ſecret *Chloe* had been marry'd.

P. S. I wou'd not give a FIDDLESTICK for your DIARY, unleſs the *Ænigmas* were wrote in *Verſe*; for, let me DIE if I do not think that *one* Poetical *Flower* will deck your GARLAND better than *two* of the former; for they are almoſt as diſagreeable as the *filing* of a SAW. 10 7 11 5 4

All the Ænigmas anſwered by Mr. *Iſaac Tarrat*, of *Epſom*.

As I was walking in the *Garden Wilderneſs*, I overheard the *Gardener* and *Cook*, as they ſat on the ROLLING-STONE: ſays he, *Bett*, I have got the RING in my Pocket, and we'll be married in 8 Day's Time; it will be *May Day*, and the Milk Maids will have deck'd their GARLANDS: and we'll have *Fox* the FIDLER, and have a jovial Dance. —— I'll croſs *over* and Figure *in*, and bid Adieu to *The Bachelor's Delight!* 9 1 3 5 10

Dear *John*, ſays the *Cook*, the MISFORTUNE is, I SAW the *Stay-maker* to-day, and he ſays my new Stays are not yet finiſh'd, the LACE-holes are not made; but you know he may get them done time enough yet; for I can hardly think of being *marry'd* in my *old ones*: But, *John*, have you lookt in the ALMANACK? will it be a *lucky Day*? Says *John* 'twill be an *happy Day!* I would not give the *Toſs-up* of a Farthing, nor the *throw* of a *ſingle* DIE for all they know about it. But, ſays *Bett*, if they ſhould ADVERTISE it, as they do *great Folks's*, I could not face it. Mr. and Mrs. would ſo look at me I ſhould be as *red*, as if I had been frying Fritters! 8 4 2 7 11 6

Anſwers to all the *Ænigmas*, in a Letter from Mr. *William Swift* to *Miſs* GARLAND. To be left with the Authors of the GENT. DIARY at *Tho. Peat's*, Schoolmaſter in *Nottingham*. 7 5

Dated *Stow*, March 8, 1758. 3

Dear Miſs!
When firſt I SAW you, buying a *ſilk* LACE. 4 2
My *Heart* with Pleaſure quitt its *native* Place
And wou'd be *Yours!* —— No need to ADVERTISE 6
(With Love-ſick Pain, there's many a Lover DIES) 11
For, if you ſmile, a FIDDLESTICK for *Fate*; 10
Enjoying You I'm Happy, Rich, and Great!
Your lovely *Idea's* fixed in my Mind,
May no MISFORTUNE make you prove unkind! 8
Accept this RING, as Pledge of conſtant Love: 1 Lat.
Which ROLLING Years, nor Time itſelf ſhall move! 9

All the *Ænigmas* anſwered by Mr. *Steph. Hartley*, in Admiral *Hawk's* (ſuppoſed) Speech to his *Sailors*, upon ſeeing the *French Fleet* appear near the Iſland of *Aix*, the 8 of *April* 1758.

Hawk. Brave Boys! Our Enemies appear!
Lets LACE them in *Front*, *Flank*, and *Rear*: 2

Pun

Point your CYLINDRIC * Cannons right; 9
And be *couragious* when you fight:
To DIE is Nature's greateſt Law, 11
Then fear not *Fire*, nor *Sword*, nor SAW! 4
A FIDDLESTICK to *Biſcuits* EIGHT 10 3
I'll lay, We *beat* them, if you'll Fight!
With GARLANDS then we ſhall be crown'd, 5
MISFORTUNES ne'er can us conſound: 8
If we all with *united* Hearts,
Determin'd are to *act* our Parts!
Sailors. We'll ſtand by *You*, they *all* reply'd,
Tho' *Common Fame* hath us bely'd ——
Hawk. Ne'er mind NEWS PAPERS † how they vary; 6
Truth will be ſpoke of *us* in th' DIARY. 7

* Alluding to a *Rolling-Stone.* † An *Advertiſ-ment.*

In the ſame Manner they were all anſwered by Mr. *Hen. Green*, Mr. *T. Sadler*, Mr. *Ch. Underwood*, in a Poem on the King of *Pruſſia's* Birth-Day, *Jan.* 24, Mr. *G. Robinſon*, on account of the Succeſs of his Arms. Mr. *John Atkinſon*, *Tryphena Goffe*, Mr. *Nathanael Feat*, and ſeveral others, which Room will not permit us to publiſh; I ſhall therefore refer the reſt to the *Catalogue* of CONTRIBUTORS at the End.

NEW ÆNIGMAS to be anſwered next Year.

(1) Ænigma 136, by Mr. *Zach. Goſkell.*

From decent Offices, and lively Scenes,
Familiar Duties, Sol's all chearing Beams;
By cruel and rapacious Hands I'm torn,
Conſign'd to blackeſt Fate with Slight and Scorn,
All Services forgot, when in my Prime;
(For Age and Weakneſs were mine only Crime)
No wonder, when from dire Extreams I'm toſt,
From Heat, to Cold intenſe as Winter's Froſt,
My Conſtitution in the End is loſt!
E'en *Sylvia*, thou ingrate, tho' fair and chaſte,
Oft have I claſp'd thy ſlender lovely Waiſt!
But all avails not to elude my Fate,
So chang'd! ſo fall'n! yet ſtill my Truſt is great;
Doom'd to an Urn; dark, ſable to the Sight
Yet *hidden* Things thro' Me are brought to Light
Tho' ſecret as the Thief that roams the Night.
Near my Abode two *warring* Chiefs engage,
With *ſparkling* Fury, and relentleſs Rage;
Their Weapons *ſhiver'd* with a mighty Blow
Darts in my Face, which ſtraight begins to glow
And feſters ſoon: and angry ſpreads around
An Inflammation from the lively Wound!
Straight an *infernal* Wretch his Lips applys,
Th' Infection ſoon o'er all his Body flies;
Price of his Raſhneſs, Pitileſs his Caſe
Deſtruction ends him for his *bold* Embrace!
But not until the ſame Contagion's driven
From him to others, as to him was given;

Ner

Nor ſtops it there, if *Caution* ſleeps —— Surprize,
And ſcreams of hideous Horror ſpreading flys!
One Hint take more, then naked is my Name,
An Emblem of the teeming fruitful Dame.

(2) Ænigma 137. By Mr. *Thomas Hare.*

Though I to Whim and Fancy chiefly owe
My Compoſition, Grace, and outward Show;
Yet ſuch my Parts conſtituent, ſuch my Frame,
Nor *Jones*, nor *Wren*, nor old *Vitruvius* blame.
Oblong, or round, or ſquare may be the Baſe,
Whilſt Groves and Fountains the gay Manſion grace.
I *Porticos* and *Drawing-Rooms* contain,
Am airy, cloſe; embelliſh'd and yet plain.
When my Inhabitants are *Engliſh* Breed,
I'm moſtly plain, from foppiſh Tawdry freed;
But when by fav'rite *Foreigners* poſſeſs'd
In Gildings gay, in rich Vermilion dreſs'd:
With gold-tipp'd Pinnacles I threat'ning glow,
And *Curves* whoſe *Properties* but few Men know.
In airy Chambers where my *Captives* reſt,
(And when awake, or ſleeping, always dreſs'd:)
No *raſter'd* Roof, nor *ſtucco* Floors are ſeen,
But all is *airy* Emptineſs within!
Yet here the Gueſts are gay, eat, drink, and ſing,
And dreſs'd more gaudy than an Eaſtern King.

(3) Ænigma 138. By *Random Junior.*

With Violence from the Earth I'm torr,
Again with Man to Earth return;
No Lawyer, for a *double* Fee
Tells *more* or *greater* Lies than me:
And he for whom I am deſign'd
Is ſo inſenſible and blind;
That, if my Labour had been *double*,
He would not *thank* me for my Trouble.

(4) Ænigma 139. By Mr. *Chr. Maſon.*

Ye learn'd Adepts who in deep Myſteries deal,
My Name and Nature to the World reveal.
Spirits are ſaid inviſible to be,
Until embody'd, ſo it fares with me:
I'm no Compound, nor Fleſh, nor Blood, nor Bone,
Nor any Metal, nor yet Wood, nor Stone;
Provok'd and fed my Property is ſuch,
No Cormorant cou'd e'er devour ſo much!
Like other Beings, often I'm abus'd
For Profit, Pleaſure, or Deſtruction us'd.
Nor *Moſes*, nor the learned *Septuagint*,
Do Me explain, but barely give a Hint,
One *Brother* and two *Siſters* he deſcribes,
Who each ſuſtain Variety of Tribes;
Inviſible, my *Brother*-Arts, yet He
Still gives me *Birth*, and then provoketh Me,
Sometimes to Rage, with great Ferocity.
One *Siſter* ſeeks my Death, when in her Pow'r,
And when She's aided Vengeance on me ſhow'r.
The *other* tho' more paſſive and benign,
'Till urg'd by Force, wou'd always me confine.

Twy-

Twy-Twinns we are, as angient Authors ſay,
Yet interfere, and troſs each other's Way;
Like Earthly Princes ſtill involv'd in War,
We ſtrive, we ſtruggle, and for Pow'r we jar.

(5) Ænigma 140. By Mr. *Zach. Gaſkell.*

Of Things inanimate, let others dream,
Make Plaints for Ills receiv'd, tho' lifeleſs is the Theme:
Deſcription wild; diſguis'd, incongruous, odd,
Pity demanded by a ſenſeleſs Clod!
But copious Nature furniſhes to Sight
Myriads of Creatures obvious to the Light,
One of her handy-works I here declare,
Silence ye Owls! your hideous Notes forbear!
Oft in the Church I am, but never pray,
During the Sermon ſleep my Time away:
For no more true Devotion brings me there,
Than *Beau* Sir *Fopling*, with his braided Hair
Studious intent to catch the *giddy* Fair.
Likewiſe where ancient Towers exalt their Head,
And aged *Oaks* with twining *Ivy* clad,
Do caſt an awful venerable Shade!
When wanton Nymphs unhouſe, inſidious ply,
You'll ſee me rambling, nimbly friſking by:
Juſt come abroad; from dull Inaction freed,
Alert, and agile as the prancing Steed.
Conſtant you'll ſee me take my *nightly* Round,
When cooling Dews refreſh the thirſty Ground.
Now here, now there, unſteady in Career,
No Rudder have from devious Paths to ſteer;
But vain's your Search, if you expect to find
Me, of the *feather'd* or *quadruped* Kind.
Bright Nymphs we were, with *Pallas* Arts well ſtor'd,
In Years of Yore, the Pagan Bards record;
But, impious Slight thrown on the jovial God,
Alter'd our State in our immur'd Abode.
Whence loneſome Scenes, and trackleſs Ways we love,
The gloomy Glade, the melancholy Grove!
Say what, that thro' ſuch joyleſs Regions rove?

(6) Ænigma 141. By Mr. *Chr. Maſon.*

From Parent Earth imperfect I was rent,
By human Art dire Changes underwent;
A Fluid State by force of ardent Flame,
Hence ſtubborn grew, as Youth will to their Shame,
Yet, when well drubb'd, I paſſive ſoon became.
By Art and Labour faſhioned and made,
To ſerve ſuch Ends where ſcorching Heats pervade:
I've Feet and Tail; but ne'er a Mouth to eat,
Altho' my Ribs are burthen'd oft with Meat;
Am in Requeſt, or Morning, Night, or Noon,
And's rode the back of many a quaint Buffoon.
It has been ſaid the Treaſ'ry knows me well;
But, 'tis a Crime in thoſe who *kiſs* and *tell*:
I'll ſay no more, leſt it be cenſur'd vain,
And I be blam'd for *blaſting* out too plain.

(8) Æni-

(7) Ænigma 142. By Mr. *Henry Green.*

Attend, ye riddling Wits, to me
And you shall hear my Pedigree.
And, be it known, that by man's aid
(And Woman's too, I'm sometimes made)
Am *white* and fit for any *Beau*,
I'm *red* and us'd by *Ladies* too:
Green as the Grass in verdant Mead,
Or *black* as Hat upon your Head:
You'll think I am a beast of *prey* [day
That haunts the desart Night and
Voracious to be sure I am
For *whole* I swallow many an *Ham*!
And *Tyger like* it is well known
Am gorg'd with *human* Flesh and Bone!
To *Church* or *Meetings* I do go
Upon *two* Legs: and you must know
That *fun'ral* Rites I do attend,
And change my colour for that *end*:
One Part I have, you need not guess,
A Foot in Length, no *more* nor *less*.

(8) Ænigma 143. By *Random Junior.*

Oft on the sedgy Bank I'm seen,
Oft tripping o'er the flow'ry Green;
In many an Hedge and Bush appear
Oft seen in Water, oft in Air;
For various Purposes am fit,
Distinguish both a Fop and Wit:
I to and fro am idly toss't, [most:
Most useful when I'm *press'd* the
If more of Me you want to know,
I'm *black* as Ink, and white as Snow:
Still more of me wou'd you descry,
There's nought can better *swim* or *fly*.

(9) Ænigma 144. By Mr. *Nicholas Stevenson.*

From hot *Iberia's* sultry Realms I come,
Oblig'd to wander from my native Home!
Princes of Noble Blood have borne my Name;
Britons with Gratitude pronounce the same:
I'm lov'd by all; but most by *Ladies* fair;
Who, tho' they love me, yet so cruel are
That they from off my Body *flay* the Skin,
And draw and quarter me, and think no Sin:
In verdant Spring I wear my Liv'ry *Green*;
In Summer *white* and *yellow* both am seen.
Or *sour*, or *sweet*, or *bitter* I am found,
And if you ask my Shape, 'tis almost round:
If *you*, who from these Hints don't know me well,
Buy the next ALMANACK —— and that will tell.

(10) Ænigma 145. By *Tabularius.*

—— *Inter strepit anser olores.* VIR. Ecl. 9.

Ye learn'd, who subtle Points debate,
Unbend your Minds, and hear me prate.
I was a *Nymph* in Days of old,
As *Ovid* sings, loquacious, bold.
Who dar'd the *Muses* on their Hill,
In *Verse* with me to try their Skill;
The list'ning *Nymphs* my Song disdain'd, [gain'd:
Nor Voice, nor Art their Favour
Repentance follow'd but too late,
When destin'd to my present State.
Have not you seen in *Corporate* towns,
Grave *Council-men* in sable Gowns,
Whose foresaid Ornaments of black
Extend o'er little more than Back?
Compar'd with me, *they* well express
My fashionable mourning Dress;
Much like the *Ladies* too, you'll find
I wear a sweeping Train behind.
When *Partlet* sings to *Chanticleer*,
(Inclin'd to Musick still) if near,
In Chorus I the Concert join,
And slily chowse them of their Coin:
Let careful Housewives then beware,
Or they will go without their Share.
But greater Services, sometimes,
May well atone for lesser Crimes;
The goodwive's Oracle; I bring
Them Friends and Strangers when I sing.

(11) Ænigma 146. By *Juſtice Ballance.*

Of all the Flights that haunt a *Poet's* Brain,
'Tis ſtrange that I ne'er enter'd with my Train;
When Things of lower Rank take up their Time
To jingle all their Properties in Rhyme.
Perhaps he'll ſay I am not worth his Toil
Since ignorant and common as our Soil;
But let him not miſtake; I've riſing Parts,
And give Aſſiſtance to *Mechanick* Arts:
I raiſe the Artiſt far above low Things,
And fix him in an higher Sphere than Kings.
I often grant him all he can deſire,
And if but *low* on Earth can *raiſe* him higher.
Yet he muſt uſe his Means, and ſtick to me
For I'm as fickle as th' inconſtant She!
Look *Euclid's* Propoſitions and you'll find
My Length when unto perpendic'lar join'd.
Pox take theſe *Angles*, *Squares* and all ſuch Stuff!
But mind me now, I'll tell you plain enough.
I am the Thing that many dread to ſee,
Becauſe I lead them to Mortality;
Take one Hint more, and then the Miſt is fled,
I raiſe the Living, or ſupport the Dead.

(12) Ænigma 147. By Mr. *Zach. Gaſkell.*

From ſmall Beginnings firſt I took my Riſe,
B'ing in mine Infancy a Dwarf in Size,
But by Degrees, tho' ſlow I upwards grew;
And a gigantick Chief appear'd to view.
So from a trifling Egg in ouſy *Nile*,
Sprung the enormous bulky *Crocodile!*
Tremendous Monſter! yet confin'd to move
In one ſtraight Path, unform'd around to rove;
But I no Dread inject, no Horrors ſtrike,
Yet have an hundred Limbs, *Briareus* like:
Stately I am; and firmly ſtand my Ground,
And brave the warring Elements around!
The ſoaring *Eagle* (Bird of *Jove*) takes place
As King and Tyrant of the feather'd Race;
The ſtately *Lion*, whoſe terrifick Roar
Proclaim o'er trembling Beaſts his regal Pow'r,
Birds *kin* to Birds, and Beaſts to Beaſts ally'd
So o'er my Kindred, I as King preſide.
More numerous are my Offſpring ev'ry Year
Than Flocks of *Geeſe*, tho' few are nurs'd with Care,
But periſh ſoon, expos'd to Beaſts and Air.
At laſt, by fatal *Steel*, when in my Prime,
(Such is the Will of Man) my Life reſign,
And to the Duſt my rev'rend Head recline.
My Hide ſtript off, performs a like good Action
As *Salt* that ſaves good *Beef* from Putrefaction;
My Heart, my better Part! what can tranſcend?
When *Albion* owns me her moſt faithful Friend!
Who can my Uſes ſcan, my Praiſe expreſs,
Who once ſecreted *Greatneſs* in Diſtreſs?

Ye

Ye jolly Bucks whose *ſtentrophonic* Lungs
Raiſe the loud Notes of *Bacchanalian* Songs,
Our Choice adopted Sons, our counter Parts!
Declare the Emblem of your *noble* Hearts.

(1) Rebus, by Mr. *Ch. Maſon.*

Three fourths of what yields us or Bleſſing or Curſe.
To which join a hundred, for better for worſe;
Three fourths of a Place which moſt Mortals do fear,
Then join *Neptune's* Empire to bring up the rear:
Then you will exhibit the Name of a Town;
Seems (by the Remains) to have been of Renown.

(2) Rebus, by Mr. *William Swift.*

Take Half the Reverſe of what guides a Ship's Courſe,
And Part of a Beaſt to which *Jews* have Remorſe:
If you join theſe two Subjects a Town it will tell,
Which in the North Circuit is known very well.

An *Alphabetical* Catalogue of Contributors to this *Diary*.

The Fig. 1, 2, 3, &c. ſhewing the Queſtions, and the Numericals i, ii, iii, &c. the Ænigmas each anſwered, &c.

ASTRONOMUS. Calc. Ecl. prop. i, ii. Mr. John Atkinſon Ænig. in Verſe, prop. 1, & Reb. Mr. Will. Bamfield i, all in Verſe but ii, iii, ix. prop. 1 Æ. Mr. W. Bevil 5, 6, 11, 12. Mr. Tho. Bowen 5, 6, 7, 8. Juſtice Ballance, prop. 1 Ænig. T. Beer, prop. 1 Ænig. Mr. Stephen Brackſtone prop. 1 Ænig. Mr. Tho. Crabtree, 1, 7, 10, 11. all Ænig. calc. Ecl. prop. 2 Qu. Mr. W. Clarke, 3, 5, 6, 8, 10 prop. 1 Qu. Mr. Tim. Drury all Qu. but 8 & 9. propoſed 1 Qu. Mr. Luke Elſtob, iii, iv, v, vi, vii, & x. calc. Ecl. Mr. W. Eaton 5, 7, 11. Mr. Henry Green, 1, 3, 7, 10. all Ænig. in Verſe, calc. Ecl. prop. 2 Qu. and iii Ænig. Mr. Zach. Gaſkell prop. 2 Qu. and iii Ænig. Tryphena Goff. all in Verſe, prop. i Ænig. Mr. Gordon i, iii, iv, v, vi, vii, x, xi. prop. 1 Reb. Mr. Tho. Hare, 2, 3, 5, 6, 7. all Ænig. but i, iii, and ix. Mr. J. Hudſon, 1, 2, 3, 5, 6, 7, 8, 11. all Ænig. but i and iv. prop. 2. Qu. Mr. J. Holroyd, 2, 6, 7, 9. ii, iii, vi, vii, viii, ix, xi. Mr. Steph. Hartley, 2, 3, 5, 6, 7, 9, 10. all Æn. in Verſe. Mr. Tho. Harris 3, 5, 7, 11. all Æn. in Verſe. calc. Ecl. prop. i Ænig. 1 Reb. Mr. Jos. Harrington 3. all Ænig. but i. Mr. William Kingſtone all but 2. Mr. Ant. Moſley, prop, 1, Qu. Mr. Charles Meſſon 3, 5, 6, 10. all Æn. but ii, viii and ix. Mr. Chr. Maſon, all Ænig. prop. ii. and Reb. Mr. Tho. Moſs, prop. 1 Qu, Mr. Rob. Marſh, all Æn. in Verſe. F. F. Mingle all Ænig. in Proſe, prop. 1 Ænig. Mr. Th. Robinſon 1, 3, 6, 7, 10, 11. vi. vii. prop. 1 Qu. Random Junior all, ſome in Verſe and ſome in Proſe, prop. ii. Mr. Geo. Robinſon all in Verſe prop. i. Mr. Tho. Sadler, moſt in Verſe, prop. ii, and a Reb. Mr. W. Swift all in Verſe prop ii and a Reb. Mr. Nicholas Sutton prop. i Ænig. Mr. Joſ. Scott, ii, iv, v, vi, vii. x prop. ii. Mr. John Summers all Ænig. Tabularius 1, 2 prop. 2 and 1 Ænig. Mr. Iſaac Tarrat, all in Verſe, and prop. 1 Ænig. Mr. Cha. Underwood, all in Verſe, and prop. 1 Ænig. Mr. Robert Wadington prop. 1 Qu. Mr. W. Weſcott v, vi, ix. Mr. John Webſter all Æ. but 6. Mr. Charles Wildbore all Ænig. all Qu. prop. 1 Æn. and 1 Qu.

FINIS.